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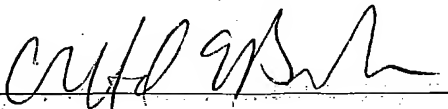
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User interface of a LEW (Learning Experience Warehouse)

As a result of it becoming simple to create documents using a computer and further to produce materials containing image data and video data, methods for storing information created or obtained by individual users on a network server in a single database so that the data can be shared by other users involved with the same task over a computer network in order to improve productivity and facilitate the communication of knowledge and information have become common.

GUI (graphical user interface) operating systems such as Microsoft Windows (R) made it possible to visually categorize this information to some extent. An icon with a unique design is assigned according to the software used to create a file, thereby making it possible to easily know what software was used to create the information. By adding an appropriate title to the created file it is also possible to guess the content of the file from the title without opening the file. The concept of folders was also introduced for organizing and categorizing these files, and by creating folders with a hierarchical structure information can be hierarchically organized by objective.

Filing methods using folders as described above are certainly effective with respect to hierarchically managing task-related information in the actual operations of a company, but the current file and hierarchical structure is deficient when it comes to organizing along a time axis project-related information that is used over an extended period of time. It is, of course, possible to create subfolders such as "orientation," "data collection," "design," and "production" inside a "Project A" folder, and create subfolders such as "Jan 2002" and "Feb 2002" in the "design" folder, in other words, to incorporate a temporal concept to the current hierarchical structure using folder names or file names. It is also possible to arrange files by the creation date by rearranging icons in the folder. However, in a networked file-sharing environment multiple users manage and use the files, and names that can be understood by others must be assigned if folder names and file names are used for time-based management. Furthermore, the current concept of time information attached to a folder is based on the creation date of the folder, and when the folders are displayed according to the creation date it is possible that the sequence of the folders will be unrelated to the folder name assigned for time-based folder management. Furthermore, the creation date of the parent folder, which is completely unrelated to the date of subfolders and files stored inside in each folder, is used. In addition, when icons inside a folder are arranged in date sequence the files can be arranged by creation date irrespective of file names, but the presentation is

a simple listing and the temporal distance between files is unknown. For example, even if File A and File B are displayed chronologically in the same folder, it is not possible to immediately know the temporal relationship between the files, that is, how long after File A was created was File B created?

This is because folders as currently used are simply containers and do not have any concept of the length of time.

The present invention is directed to these problems, and from the standard data filing method used up to now provides a method that, by adding the concept of a time span to the current folders and arranging files managed inside a folder along the time base, enables organizing and filing information using the time base as an important organizational factor.

Furthermore, using the folders of the present invention enables time-based management of information relating to a series of tasks, enables obtaining systematic information or knowledge by tracking information over time rather than simply managing data, and enables an extremely wide range of applications including learning from past events, continuing past experiences, and reflections of these.

Moreover, organizing such information on a time base enables the individual to compile a personal work history, and can be used for personal work evaluations and a record of growth. From the perspective of personnel managers, this information can also be used for individual job performance evaluations and by extraction as a tool for project management.

Basic concept

Object management in today's computers is accomplished using folders indicative of a directory and icons indicative of files. When displaying these objects the present invention adds the concept of time to each object. As a result, the concept of time is also given to folders, and time can be defined by position on the time base. This is because folders are used as a tool for managing a group of related jobs such as "projects," "processes," and "tasks" having length on the time base.

Fig. 1 shows the management of files displayed using folders according to the present invention. This is similar to the general file management concept used with computers, and its method of presentation first becomes easily understood by the user by using a desktop metaphor and a standard, commonly used GUI having windows, folders, and contextual menus, for example.

Folders for Project 01 to Project 19 are displayed in left side display area 101 of the window. Time is presented on the horizontal axis and folders are displayed with width in the horizontal direction in right side display area 102. These folders impart the concept of time to each Project folder in left side display area 101, and the left and right ends of each folder indicate the time allocated to a particular time folder. It can therefore be known, for example, that Project 02 is a project that should have lasted from approximately February 15 to approximately May 7. The time-based width of a time folder can be set as further described below when the folder is created or using the folder properties settings.

As will be understood from this figure, if Project 01 to Project 19 are each different projects, the time-based overlap between each project can be visually understood. Furthermore, if Project 01 to Project 19 represent individual steps in some project, how that project is progressing can be understood at a glance. Yet further, by arranging each project by project manager, the time-based load on each manager can be visually understood.

When the Project 03 folder, for example, is opened as shown in Fig. 2, the related materials are also displayed on the time base and what tasks were performed when can be visually understood.

Basic screen configurations

Fig. 3 shows the window configuration of the present invention. Included are main screens 301 for displaying shared information, and sub-screens controlling input to and output from the main screens.

The main screens are described first. There are three main screens 301, the shared information screen 310, project screen 311, and knowledge screen 312, respectively having the following functions.

1) Shared information screen 310

This screen is for presenting general information not associated with a specific project, such as memos, news, and libraries. For example, information such as communications within a department, industry news, and templates for shared documents are presented in this shared information screen. A search screen 313 for finding the required shared information is also included in this shared information screen.

2) Project screen 311

This is a screen such as shown in Fig. 1 and Fig. 2 for displaying projects, and displays the hierarchy of the Project, Process, or Task, for example, and the files stored therein. There is also a search screen 314 for finding a project, and a graphing screen 315 for displaying a graph of part of the data.

3) Knowledge screen 312

This is a screen displaying guidelines, techniques, methods, and other more general knowledge relating to performing a job rather than pertaining to a specific project, and also includes a search screen 316. While the shared information screen 310 displays temporary information that gets updated, the knowledge screen 312 displays more specialized, academic, general knowledge.

The sub-screens described next below are what control input and output to and from these main screens 301. There are four sub-screens as follow.

1) Login screen 321

A screen for logging in to this system.

2) Recently stored files screen 322

Shortcuts to files stored by an application are displayed in this screen, which is normally resident in the background.

3) Template screen 323

A screen for inputting data not dependent on an application.

4) Content screen 324

A screen for displaying files stored on a server.

The recently stored files screen 322 is displayed for applications run on the client side, and other applications are all run on the server side and displayed on the client side.

Of these sub-screens the recently stored files screen 322 and template screen 323 in particular are used as input screens for inputting files to the main screens 301. Shortcuts to files stored by an application are displayed in the recently stored files screen 322, and by following these shortcuts the files can be registered in the main screen on the server side.

The template screen 323 is used for inputting data not dependent on an application, and data can be displayed in the main screens 301 by selecting an appropriate template and inputting data (such as text and images) to the template.

Other input methods include input from the desktop and between main screens. The desktop is a method for copying files on the desktop and directly registering them

in a main screen. Between main screens refers to a method for registering files by copying files registered in the shared information screen 310, for example, to the project screen 311.

Basic screen layout

The basic layout of the main screen is described below using the above Project screen of the main screens by way of example. While there are variations in icon size and arrangement in a normal GUI, objects (subfolders and files) inside a folder are displayed as shown in Fig. 4.

As shown in Fig. 1, a list of the objects is placed in the left side display area 101 of the screen in the main screen according to the present invention, maintaining compatibility with the general file management display methods current today. In other words, the vertical axis is an object list.

Because the concept of a time base is added to this display, the horizontal axis is the time axis and temporal attributes of each object are displayed. If this method is incorporated in the GUI of the OS, such as by adding a "calendar view" to the display options within a folder, a display such as shown in Fig. 1 can be selected and presented when the calendar view option is selected. The screen display can also be changed using the same operation as the conventional "show details."

A common basic layout is preferable from the standpoint of usability in the project screen 311, shared information screen 310, and knowledge screen 312 contained in the main screens. However, when the concept of time is not needed in the knowledge screen 312, for example, it is also possible to not present a calendar view for the knowledge screen 312. A common layout is also desirable in the content screen 324, but can be changed according to the situation. This is because the content screen 324 cannot usually be edited by anyone other than the author and is the display of the display center [sic].

The basic screen configuration has from the top of the screen a title bar 103, menu bar 104, directory (path) bar 105, and a toolbar 106. A time scale button 107 for changing the time scale 108 is located below the directory bar 105. Below the time scale button 107 is an Abstract button 109, and to the side are a display switch 110 and Compressed List View button 111. The function of each button and switch is described below.

Basic operation

(1) Open, Expand

The basic operation of the main screens is described using the project screen by way of example.

The login screen 321 is first activated and the required ID and password are entered to log in to the system.

When login is finished the display settings and the screen displayed when operation last ended are restored. If only projects managed by the user are usually displayed in the project screen 311, the system starts up in the same condition and file registration can commence immediately.

A project screen 311 is presented first as shown in Fig. 1. "Project Warehouse" is displayed in the title bar 103 so that the user knows that the currently active screen is the project screen. If the selected main screen is the shared information screen or knowledge screen, the title bar will change to "Information Warehouse" or "Knowledge Warehouse," respectively. Projects displayed in the project screen 311 can include all viewable projects, but it is also possible to arrange the display by project manager as further described below or use the display switch to display only selected folders. The temporal relationship between the plural displayed projects can be seen at one look in the project screen display.

When Project 03, one of the Project folders displayed in the right side display area 102 of the window, is opened, a new window 201 for Project 03 is opened on top of the project screen as shown in Fig. 2, and the contents stored in the Project 03 are displayed. In this example there are six subfolders and one file in Project 03. These subfolders are also displayed with a width corresponding to the set time span in the same way as folders in the project screen.

When the Concept Generation subfolder is opened the files contained therein are displayed along the time base as shown in Fig. 6. When the file to be used is then selected from amongst these, for example, if the Preliminary Concept file is selected, a window for file viewing is opened and the content is displayed (Fig. 7). To view a different file in the same subfolder, the next file (such as Chart_01.jpg in Fig. 6) can be displayed in time sequence by simply pressing a move button 701 located in the top left of the window without closing the file being viewed.

Tabs are also displayed on the title bar so that when multiple windows are open at the same time the depth of the currently active folder in the folder hierarchy can be

known at a glance as will be understood from Fig. 2, Fig. 6, and Fig. 7. As the hierarchy is descended short tabs 202, 601 are displayed overlapping so that the hierarchical depth can be understood visually. The window path is also displayed in the directory bar 203, 602, 702 below the menu bar.

Opération is described here using the project screen 311 by way of example, but registered files can be displayed as a content screen 324 by performing the same operations in the shared information screen 310 or knowledge screen 312. The system is also designed so that which screens are currently open can be easily visually determined by changing the color of the title bar in the project screen 311, shared information screen 310, and knowledge screen 312.

Furthermore, the project screen 311, shared information screen 310, and knowledge screen 312 can be easily switched by operating the main screen display buttons 112, 113, 114 that are made [sic] the toolbar 106.

Furthermore, the hierarchy is descended in Fig. 2 by opening folders in the right side display area of the window, but as shown in Fig. 8 it is also possible to open folders lower in the hierarchy by means of operating box 801 located to the left of the folders in the left-side display area of the window. Furthermore, as shown in Fig. 9, it is also possible to select a folder in the left-side display area of the window and display a contextual menu, select View from the menu, and open a window presented by this View to reach the desired file. If the user wants to view a different file in the same folder after opening a file in the desired folder, a separate file can be viewed without first returning to a higher level in the hierarchy by simply clicking move button 701 at the top left of the screen as shown in Fig. 7.

The content screen 324 shown in Fig. 7 basically has the same functions as a browser and can display the content of all file types that can be displayed by a browser. The operation of clicking on the move button 701 (advance button) at the top left of the screen means to link to a chronologically later (newer) file. If the move button 701 is operated after finishing viewing the content of a given subfolder, the link moves to a chronologically later (newer) subfolder, the contents of which are then displayed. If there are both folders and files in the subfolder, objects are preferably displayed in chronological order from the first (oldest) object.

This action of continuously viewing content as described above is referred to herein as a "content slide show." The content slide show is set up to enable moving between subfolders. This slide show could therefore continuously present a complete

process such that the content of any design work is seen after viewing the content of data collection.

If the compressed-list view button 1004 as shown in Fig. 10 is operated to view more projects at one time, the display is compressed so that the viewing area can be expanded without scrolling the screen.

Conversely, it is also possible to selectively display any selected project.

What Fig. 10 and Fig. 11 show is a method for selectively displaying projects using a display switch. In the project screen shown in Fig. 10 the boxes located to the left side of the folder icons in the left-side display area of the window are display switch boxes 1002, and by checking these boxes 1002 and operating display switch 1003 only those folders selected by the display switch boxes 1002 are displayed as shown in Fig. 11. If the display switch box 1002 for any unnecessary folder is then deselected, the selection is automatically cancelled and that folder is automatically removed from the display.

There is also the method of using display filters to select the displayed folders as shown in Fig. 12 and Fig. 13. As shown in Fig. 12, if "Designer," for example, is selected with Tool-Display filter [sic] in the menu bar, the folders can be displayed hierarchically by designer as shown in Fig. 13. It is, of course, possible from this display to use the above-described display switch boxes 1302 to further focus the displayed folders. By selecting only Projects 11, 15, 22 for "Brian" in Fig. 13 and then clicking the display switch 1302, only the selected Project folders are displayed as shown in Fig. 14.

In a yet further method the required folders can be displayed by searching. A search window 1401 is displayed when Tool-Search is selected from the menu bar from the display shown in Fig. 14. When the search words, such as "Cellar [sic] Phone," are then input and the search button clicked, only the related folders are selected and displayed (1402). It is, of course, also possible to then use the display switch to further reduce the folders.

A method of displaying folders thus selected is described next. The time scale button 1501 in Fig. 15 changes the unit of the time axis 1502, and when the time scale button 1501 is clicked the time scale of the time axis 1502 can be changed from semi-monthly to twelve months. Fig. 15 shows the time scale button 1501 "1" selected and the time axis 1502 displayed as a period of one month. Fig. 16 similarly shows time scale switch 1601 "6" selected and the time scale displayed as a period of six months. It

is thus possible to change the unit of the time axis in the main screen by using the time scale buttons 1501 and 1601.

It is also possible to use an abstract pulldown menu to change the displayed files. When the abstract 1602 pulldown menu is clicked, "Past Folders," "Present Folders," and "Future Folders" are displayed as shown in Fig. 16. This is a menu for grouping and displaying folders as past folders, current folders, and future folders based on the current date. For example, if Past Folders is selected in Fig. 16, only past files are displayed referenced to the date and time of the operation. It should be noted that the vertical lines 1603 and 1702 displayed in the middle of the right-side display area of the window in Fig. 16 and Fig. 17 denote the current date at which the files are being viewed. In the Fig. 17 example we know from the position of line 1702 that the date of operation is approximately May 6.

A thumbnail display of image files is also possible as shown in Fig. 18. Image file thumbnails are displayed if the View-large icon is selected from the menu bar (not shown in the figure).

If the calendar display exceeds the window size the remainder can be seen by scrolling the window horizontally. The scroll bar position is the same as in a normal window display, and the calendar dates also scroll in conjunction with window scrolling. The scroll width is adjusted to the defined time span of the folders or the time span of internal objects.

As shown in Fig. 17, if there are folders that cannot be displayed on the time axis of the currently displayed window, triangles 1701 are displayed denoting the existence of such folders and whether those folders are past or future folders relative to the currently displayed time axis. It is known from the example in Fig. 17 that the Project 01 to Project 03 folders are in a period before February 2002. If an undisplayed folder is in the future on the displayed time axis, the corresponding triangle is displayed at the right end of the time axis. If one of these triangles is then selected, the display automatically scrolls (jumps) so that the currently undisplayed folders are displayed.

Two projects that cannot be displayed on the same time axis, such as Project 03 and Project 06 in Fig. 17, can be displayed in the same window using overlapping windows with different time axes as shown in Fig. 19. As for the specific operation, the triangle 1701 for the displayed Project 03 is selected and "insert window" is selected from a contextual menu (not shown in the figure). Another time axis 1902 independent of the time axis 1901 for the currently displayed project list is then displayed, and by

separately scrolling this time axis both Project 03 and Project 06 can be simultaneously displayed in the same screen as shown in Fig. 19. In this case the time scale conforms to the time axis 1901 of the currently displayed window, and is therefore a six month scale.

Furthermore, when comparing two projects that cannot be displayed within the same time axis range, it may be desirable to display the projects with a relative time axis comparison rather than comparing absolute time axes. In this case separate windows can be selected from the menu in Fig. 17 to display areas with different time scales arranged vertically as shown in Fig. 21. The calendar display separating the areas can be moved vertically and positioned between any desired projects with different time displays on top and bottom.

Creating a project

A method for creating a project folder is described. Items that can be set for a project folder include the following.

- 1) Name: name of the folder
- 2) Folder color: color of the folder icon (visual grouping)
- 3) Period: target time span of the folder, reflected in the calendar display. The creation date by default and denoted as a point on the time axis, but because the folder period is determined according to the date and time of objects in the folder, the period is updated according to the date and time when new files, for example, are registered.
- 4) Manager name: name of the manager of the folder; also used for display filters.
- 5) Subfolder: a setting for subfolders created inside a folder
- 6) Reference folder: sets a reference folder

All folders, files, and other objects displayed in the project screen 311 are stored on the server. When a new project is created in the project screen 311, the information required to define the project, including the above items, must be input to the server.

A specific method for creating a project folder is described using a project definition template. When New Project is selected from the File menu, a window 2201 for creating a new project is opened as shown in Fig. 22. The project name 2202, client name 2203, and project summary 2204 are input here and the next button is clicked to proceed to the next screen. The folder color 2301, the name 2302 of the responsible designer, and related projects 2303 are input to the project attributes window (Fig. 23).

The project schedule is then input at the next screen (Fig. 24). The project start date 2401 and end date 2402, processes 2403 anticipated in this process [sic] and the respective start dates 2404 and end dates 2405 are input. Because these processes are positioned as subfolders of the created project, four processes, i.e., Orientation, Research, Concept Generation, and Development, and the respective start and end dates are input in the present embodiment as shown in Fig. 24. This information is requested by items in the templates of the present embodiment, and other input items, such as the project budget and end product, can also be defined as required. A new project thus created is Project 04 shown in Fig. 25. It will be noted that the four subfolders Orientation, Research, Concept Generation, and Development input as processes are located in the respectively defined periods at the level below the Project 04 folder. As with the triangles 1701 described in Fig. 17, it is also known that Concept Generation and Development exist on a future time axis that cannot be displayed on the current time axis display (2501).

The settings for each folder can be confirmed and changed as needed by clicking the Property button 2502. In addition, if a folder at a level below the created folder is required, a lower level folder can be created by selecting the target project from the project screen and selecting create New folder.

It should be noted that an input method using a project definition template is described in the example shown in Figs. 22 to 25, but as another method it is also possible to enable creating new projects only from the main screen. A method inputting the above-described required items using software wizards when creating a new project and selecting the project folder to directly create subfolders is also possible.

Creating and storing object files

A method for saving object files to a folder thus created is described next. A method using Recent Filed Link [sic] is described first. Recent Filed Link is a constantly resident application activated when the client computer starts up, and internally stores a shortcut file to a file at the same time a file is created and saved on the computer. It normally runs in the background and is therefore not displayed, but can be displayed from the task tray or task bar at the bottom of the Windows (R) screen.

Fig. 26 shows saving an object file using Recent Filed Link. When the Recent Filed Link button 2601 is clicked, a Recent Filed Link window is opened and files linked by Recent Filed Link are displayed.

A necessary file on the client side can be moved to a target folder on the server side by dragging and dropping the file to be moved from the Recent Filed Link window to the target folder (on the server). Application-dependent file formats are converted to a general purpose file format on the server side at this time. For example, a PSD format file created in Photoshop (registered trademark of Adobe Systems Incorporated) is converted to JPG, and AI format files created in Illustrator (registered trademark of Adobe Systems Incorporated) are converted to PDF. This enables even users that do not have these applications to view the files.

The moved files are located in the folder along the time axis of the folder based on the time stamp of each file. A time stamp of the time when the file was registered in the server is assigned to the file separately from the time stamp from when the file was created on the client, and the files are placed on the time axis of each window based on the server registration date. For example, if a file created yesterday is stored to the server today, the icon is placed at today's date. The user can freely change the server time stamp. As shown in Fig. 27, for example, there is an Observation file 2701 in the Research folder of Project 04. As described above, this Observation file 2701 is placed at May 7, the date this file was registered, according to the server-side time stamp (that the date was May 7 is known from the date line 2703 described above). If it is desirable to change the registration date of this file 2701 to May 10, the file can be moved to the desired registration date by dragging file 2701 with a mouse to the date position 2702 for May 10. If the file is moved to a date outside the predefined time axis of the folder, the time axis of the folder for managing the file is automatically changed and extended so that the file can be displayed on the same time axis. Conversely, if the time axis of the folder is compressed, the locations of files displayed according to the time axis also change.

Another storage method is to register files directly from the desktop. An example of such a method is to use the My Document button to paste from the My Document file to the target folder. When the My Document button 2801 is operated as shown in Fig. 28, My Document window 2802 opens and the files stored in My Document are displayed. Then, as with Recent Filed Link, client-side files can be moved to the target server-side folder by dragging and dropping the client-side file to the target folder on the server. As with Recent Filed Link, the file format is also converted as necessary. The same method can be used to store messages from an e-mail application directly to the project window.

As described above, files created by a user can be registered in a folder using a common file creation method, but another method is to reuse files relating to a similar job created in the past. Reusing all or part of past data for a different, similar task is in particular both a very common and effective method used in corporations.

First, as shown in Fig. 29, Project 22, i.e., the project currently being created, and Project 04, the project to be repurposed, are selected and displayed. If the two displayed projects can be displayed on the same time scale there is no particular problem, but if the difference between the time axes is great and display on the same time axis is not possible, both projects are displayed simultaneously by displaying one of the projects in an overlapping window with a different time display and scrolling only that window (see the description of Fig. 20). Fig. 29 shows an example in which a Research Product file and Question file are copied to a target folder by dragging the Research Product file and Question file stored in the Research folder of Ellen (Project 04) and dropping them in the Research folder of Brain [sic] (Project 22).

When reusing files in this way it often happens that only the important files are repeatedly reused. If information indicating what and who created the source file that is reused, or the number of times the file is viewed or copied, is also stored with each file, this file history can be used as an indicator of file importance and can therefore also be used to evaluate the author of the original file.

Time management

When objects, which can be considered the work product, are managed by themes using folders having a time axis as described above, time management of the objects is another important topic. The present invention provides an effective means in this regard.

Fig. 30 shows an input screen for time management. This input screen overlays a transparent layer to the project display window for overlaying a display of information related to the project or process.

Fig. 30 shows the relationship between the three projects managed by Brian and the time spent on each, and enables overwriting the process time required for tasks in each project or process. It is known, for example, that a total of seven hours, including two hours spent on Project 11 and five hours spent on the Development of Project 15, were worked on May 6. It is also known that the five hours spent on Project 15 were Development work. The total hours worked on a given day are calculated and displayed

in the top row of the numeric input area, and the total hours spent on each project or process are calculated and displayed on the right side.

It is therefore possible to see how much time was spent on what tasks each day in a list. It is also possible to determine at once how much time is spent on each project, for example, by selecting all projects currently associated with oneself and displaying the related Consumed Hour [sic].

In addition, as shown in Fig. 31, if Graph is selected from the menu instead of Consumed Hour [sic], the hours consumed that were numerically input are displayed as a bar graph, enabling the job time to be understood visually. For the side managing a project this function can be used as an extremely effective management tool, facilitating knowing how much time each person is spending and how much time is spent on each step of the project. Because the time required for the project and the budget calculated therefrom are also recorded at the same time, it can be reused as reference material for estimating when a similar project occurs in the future.

Printing and projection

Files created as described above can be printed in various forms.

First, there is an index print for printing a thumbnail of the files contained in the folder as shown in the print preview in Fig. 32. With the index print a thumbnail of each file is printed in chronological sequence and the time axis is also printed so that the file registration dates are also known. When the folders to print are selected, the contextual menu displayed, and index print selected, print preview and print are displayed in the menu. If print preview is selected the preview window 3201 opens and the files contained in the selected folder can be previewed. When print is selected an index of the content of the selected folders is printed. It will also be obvious that the print button 3202 at the top of the window can be pressed to print as previewed if it is desirable to print from the preview.

The directory print function for batch printing files contained in a given folder is described next with reference to Fig. 33. Directory print prints each file as a continuous job, but the time axis is also printed so that the file registration date can also be known. As with directory index print [sic], the folders to print are first selected and then when the contextual menu is displayed and print (meaning directory print) is selected, preview and print (meaning to print) are displayed in the menu. If preview is selected, a preview window 3301 is opened and objects in the folder are displayed in the preview

window. If print is selected, directory printing begins. To print from the preview the print button 3302 can be pressed to print. Furthermore, if it is desirable to preview all files, all object files can be viewed in sequence by using the move buttons 3303 at the top left of the window as described above.

A method for selecting the folders to print and displaying a contextual menu is described in the present embodiment, but it is of course possible to select and print from the menu bar.

It is also possible to project a sequence of files stored in each project using a projector in the same way as with the print function. The time axis is also projected in this case so that the file registration dates can be known.

Shared information screen

While operation in the shared information screen 310 is basically the same as operations in the project screen 311 described above, operations in the shared information screen 310 are described briefly below using Fig. 34 to Fig. 37.

Fig. 34 shows project screen 311, and to move from project screen 311 to knowledge screen 312 it is only necessary to use the main screen display buttons (3401 to 3403) provided at the right side of the tool bar. Reference numeral 3401 is the project screen display button, 3402 is the shared information screen display button, and 3403 is the knowledge screen display button. When the project screen 311 is displayed as shown in Fig. 34 and the shared information screen display button 3402 is clicked, the shared information screen 3502 is displayed on top of the project screen 3501 as shown in Fig. 35. By changing the color of the title bar in the project screen and shared information screen, the type of screen that is in use can be determined by color in the present embodiment. To see registered files in the shared information screen, the folders to view are selected using the same operation as in the project screen, and when the target objects are selected the selected objects can be displayed and viewed in a separate window.

A method for registering new information in the shared information screen 310 is described next. File-New-template is selected from the menu in the shared information screen 310. Four selection options, "text," "image," "text + image," and "HTML," are provided corresponding to the types of data to register. For example, if "text + image" is selected, an input screen 3601 as shown in Fig. 36 is displayed. If the My document [sic] button 3602 is clicked, a My Document window 3603 is opened and

the files stored in the My Document file [sic] are displayed. The image file StylusC80.jpg and the text file StylusC80.txt are then selected from the My Document window, and the image file and text file are respectively pasted and saved in the desired areas in input screen 3601. It is, of course, desirable to assign a name enabling object content to be easily understood when saving the file. If the saved file is then selected, it can be confirmed as a file having appropriately placed image and text as shown in Fig. 37.

Transmitting search strings

A search string can be transmitted for moving between information related to the main screens to, for example, display related knowledge from the project screen 311 or shared information such as related news from the knowledge screen 312.

Fig. 38 and Fig. 39 show sending a search string from the project screen to the knowledge screen. It is assumed that while viewing the project screen in Fig. 38 the user wants to search for knowledge related to the keyword "Research." In this case when the word "Research" is selected, a contextual menu displayed, and "Search" is selected, a menu enabling three selections, "Project Warehouse," "Information Warehouse," and "Knowledge Warehouse," is displayed. If "Knowledge Warehouse" is then selected, the knowledge screen 3901 is automatically activated and the Knowledge Search window 3902 is displayed as shown in Fig. 39, the word "Research" selected in the project screen is sent automatically to the Knowledge Search window 3902 as the search word, a search is run, and the search result is displayed in window 3903.

In other words, by simply selecting a keyword in the project screen and specifying the search object (knowledge screen), the character string is sent as the search string for the knowledge screen, and related knowledge is automatically listed. Searching for related files between main screens can be accomplished very smoothly by means of this search function.

Registering shared information and knowledge in a project

That it is possible to learn from past examples and continue events in the project screen 311 by reuse rather than only registering and viewing files that a user created was already described above. However, it is also often the case that past events that should be learned by the user are not limited to files created by other users, but extend

to various kinds of information registered in shared information and knowledge [sic], for example.

It is possible in the present invention, as shown in Fig. 40, to copy information registered in the shared information screen 310 to the project screen 311. Necessary files are being copied from the data library (Information Warehouse), assumed to be commonly used by the members, to a folder in the project screen. The copied file is transformed from so-called shared information to a project-specific file by editing necessary parts.

Fig. 41 likewise shows an example of copying information registered in the knowledge screen to the project screen. The method called "Observation" is learned and the used knowledge is stored as a project event.

It is thus possible to store to the project screen everything experienced in the project, including created files, referenced files, reference data, reference URLs, e-mail messages used for communication, what data libraries were used, and learned knowledge. Another user can thereby experience in a short time exactly the same events experienced by that person, and better performance can be pursued based on those experiences.

Merging plural files

Registering various files as events is described above, but it is also possible by creating links between multiple files to handle the multiple files as a single event.

For example, it is common to create and manage as a separate file B an explanation about some file A and the advice of some other person, or to create such a file B with another application. However, memory of the relationship between files A and B thus related fades over time, and other viewers may be completely unable to grasp the relationship. Therefore, merging plural files as discussed here is an operation for virtually integrating files that have an extremely strong correlation and yet exist as separate files.

Fig. 42 shows an example of linking a "Comment" file containing comments about a "Question" file to the "Question" file already registered in the Research process of Project 04. The "Comment" file is first displayed using Recent Filed Links (4201). When the Comment file icon is dragged and dropped on the "Question" file of Project 04 to which a link is desired, a contextual menu is displayed. If "merge icons" is selected from the displayed contextual menu, the "Question" file icon and the

"Comment" file icon are displayed linked with a line (4301) as shown in Fig. 43. This is the merging of files. Merging is not limited to two icons, and other icons can be dropped on top of this icon to merge three or four icons. To cancel a merge (separate the icons), "separate icons" is simply selected from the contextual menu. When this happens the integrated files are re-registered as separate files. Normal file operations, such as delete and copy, can also be performed on merged files.

When a merged icon is activated the plural merged files are simultaneously activated as shown in Fig. 44. In this example files created with different applications are simultaneously activated, but files created by the same application are opened as separate files by the same application. Multiple related files can be viewed simultaneously by activating the files simultaneously.

If this type of file integration is used it is possible by, for example, merging a description with an image file to easily find a desired image even if an image search function is not available by searching the text content of the description file. By using this so that another team member can add another idea to a file containing some idea, it is also possible to brainstorm over a network.

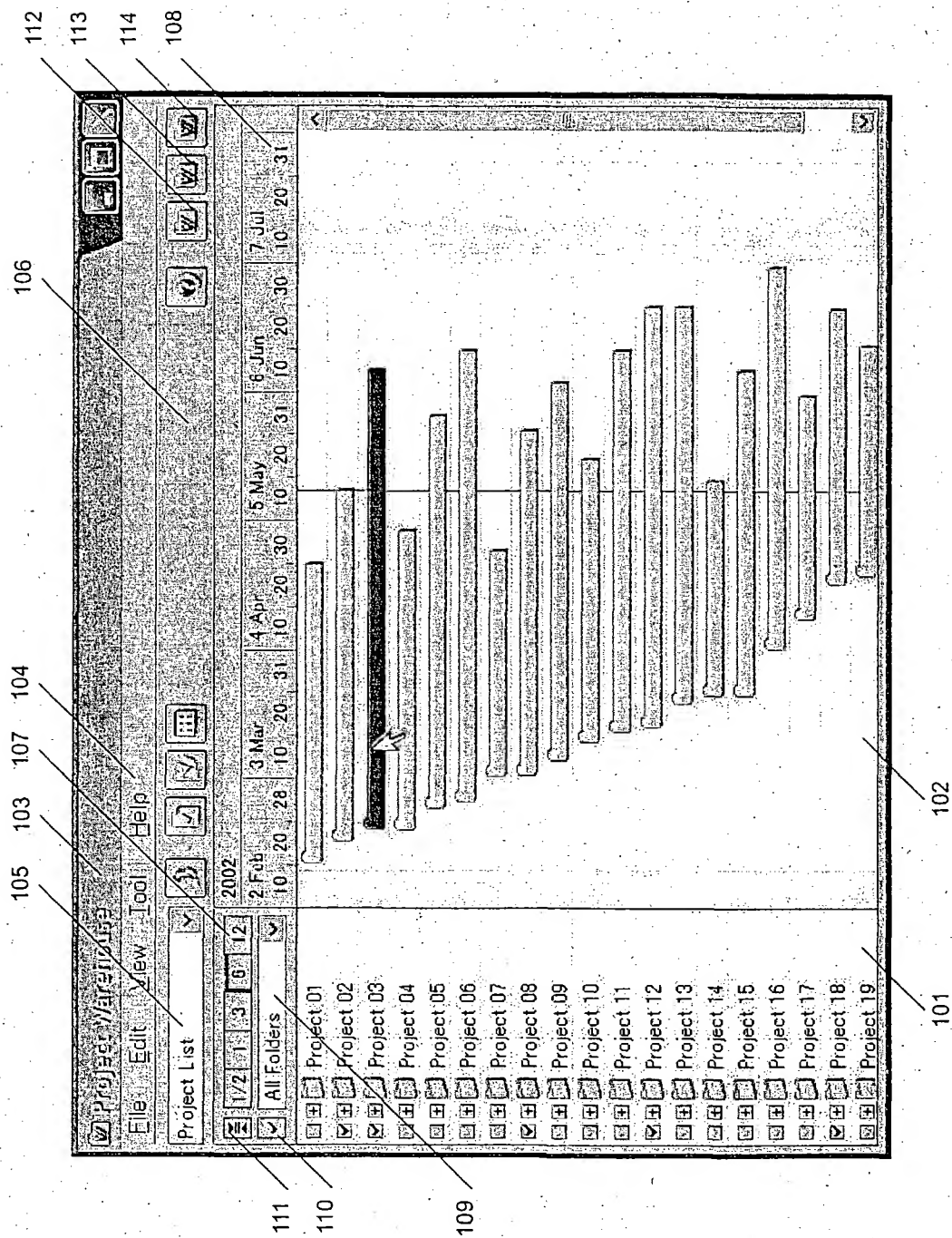


Fig. 1

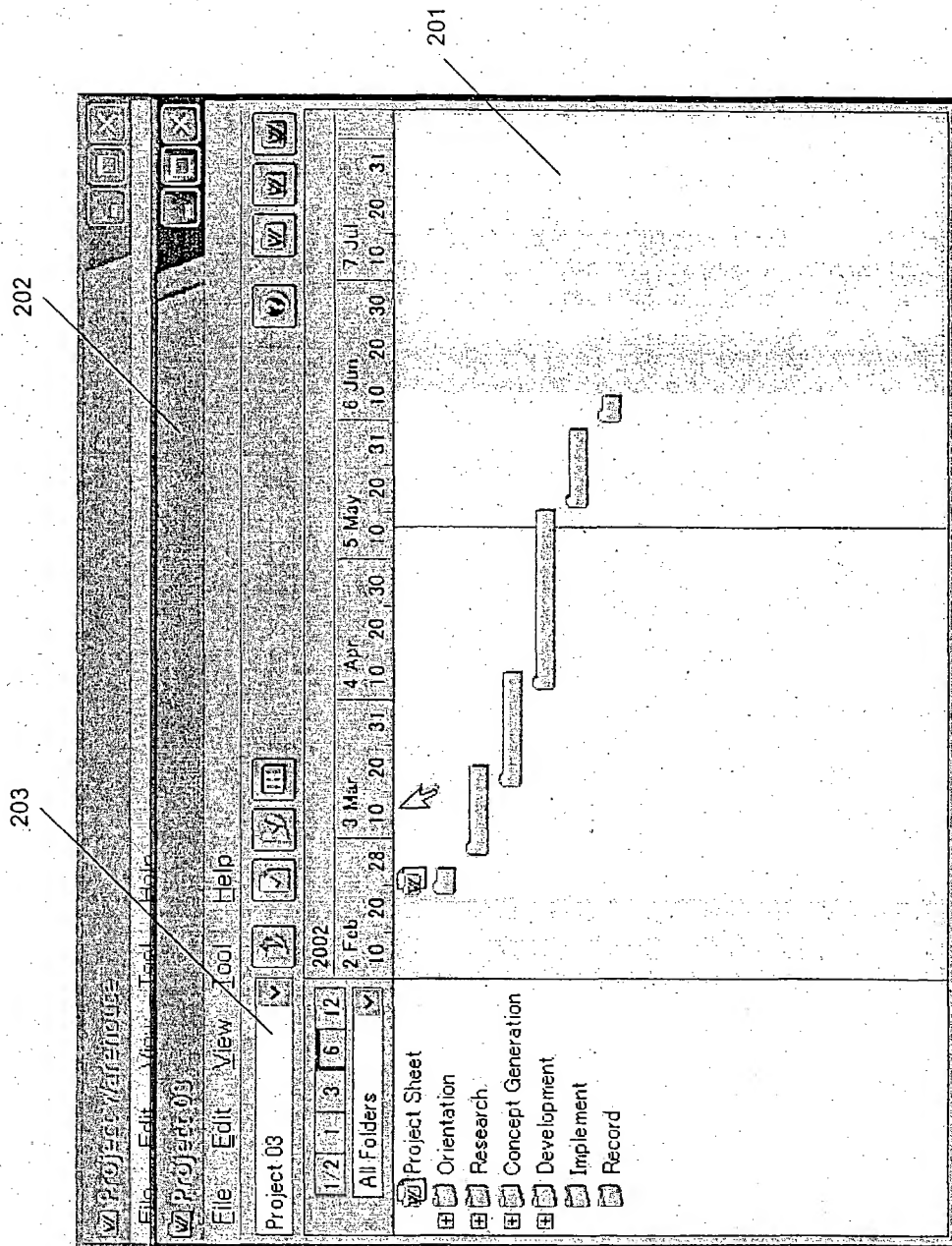


Fig. 2

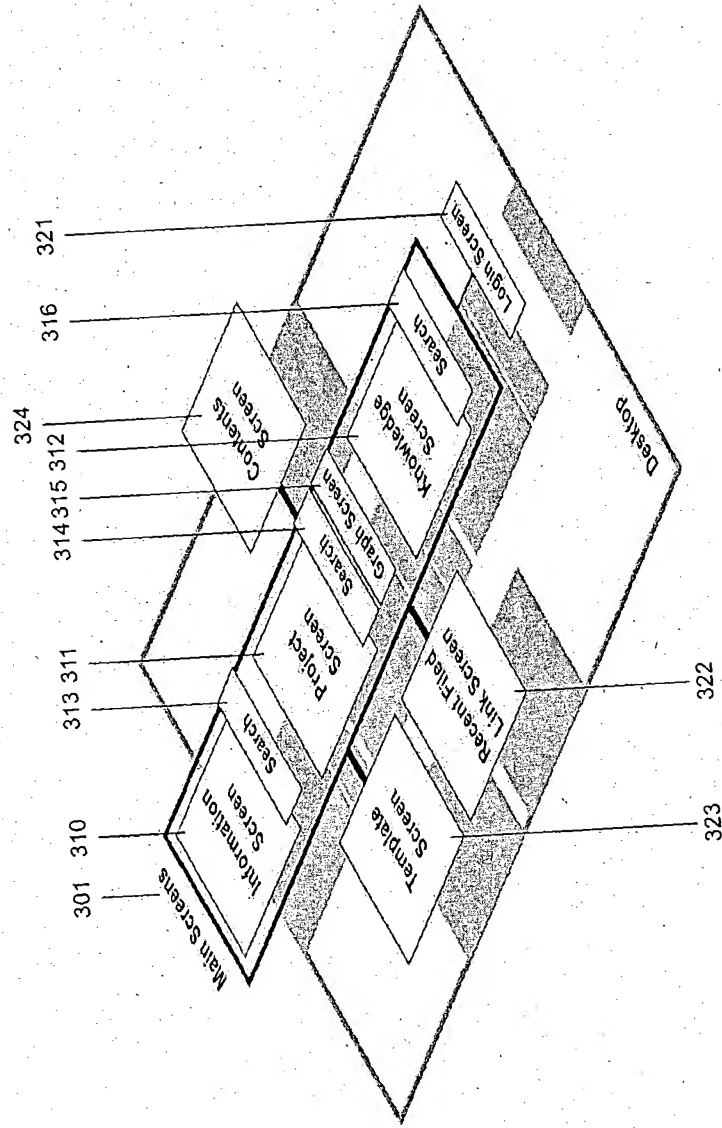


Fig. 3

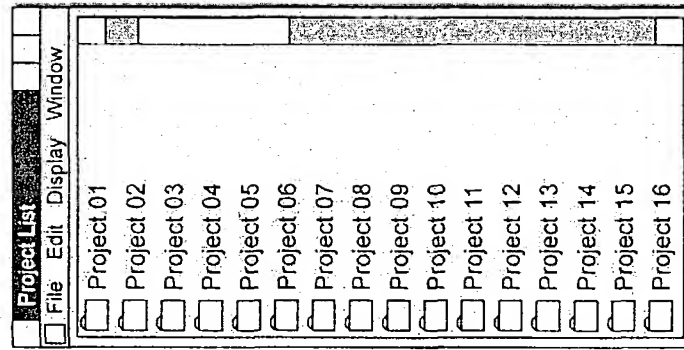


Fig. 4

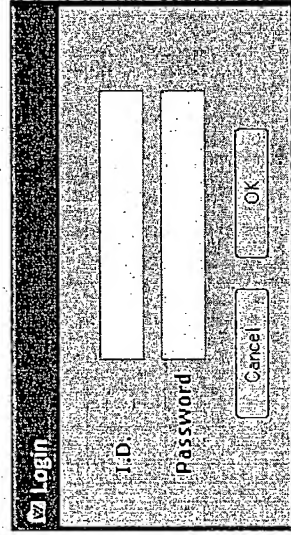


Fig. 5

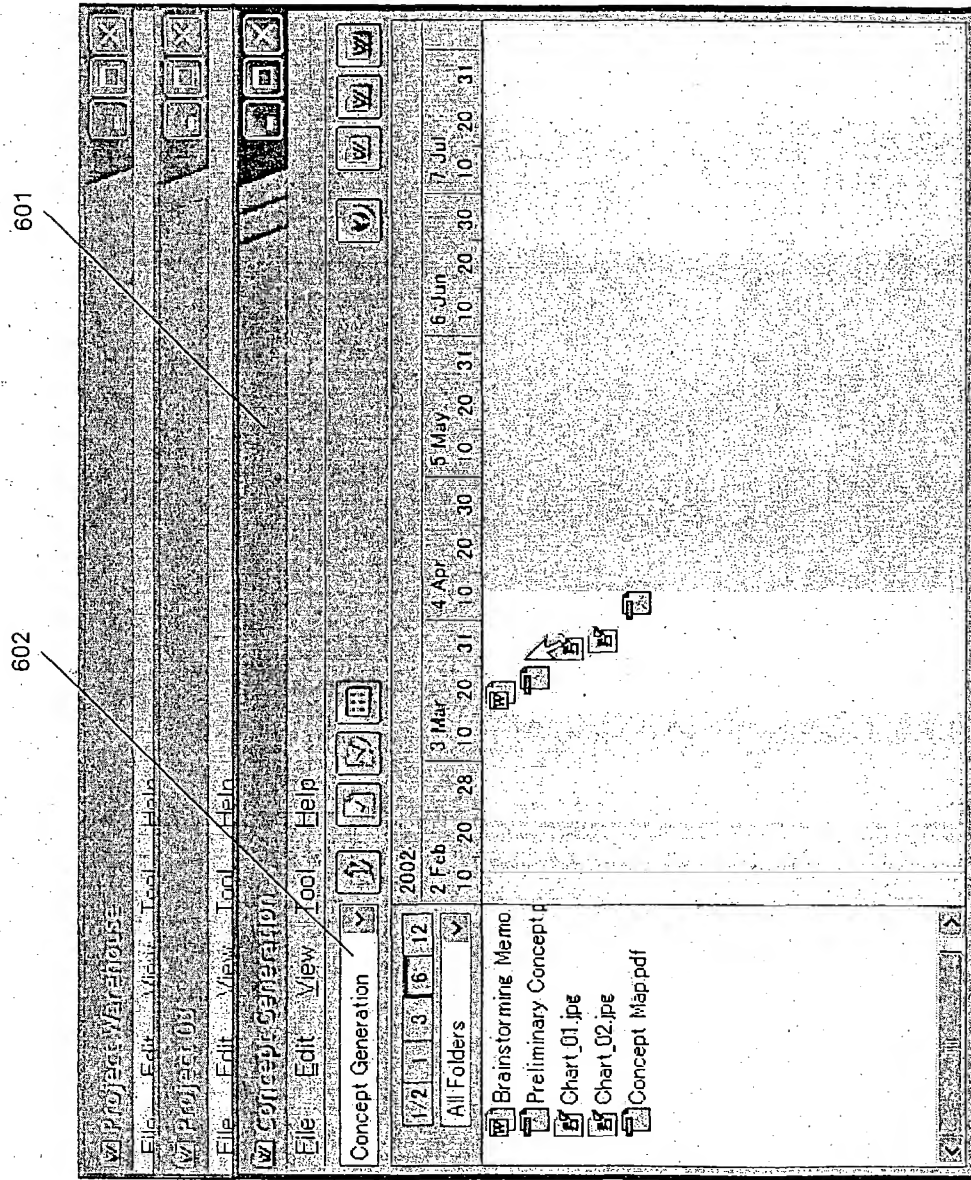


Fig. 6

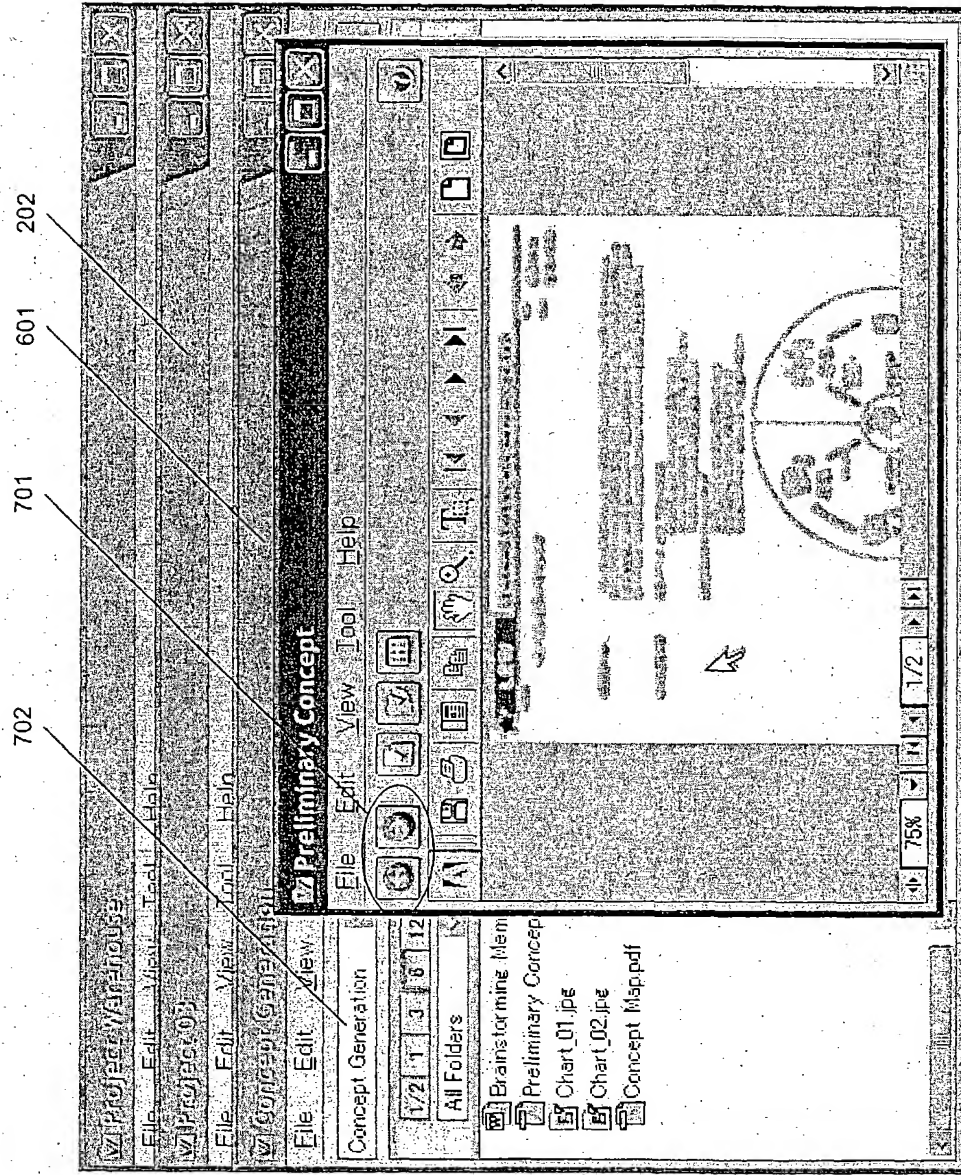


Fig. 7

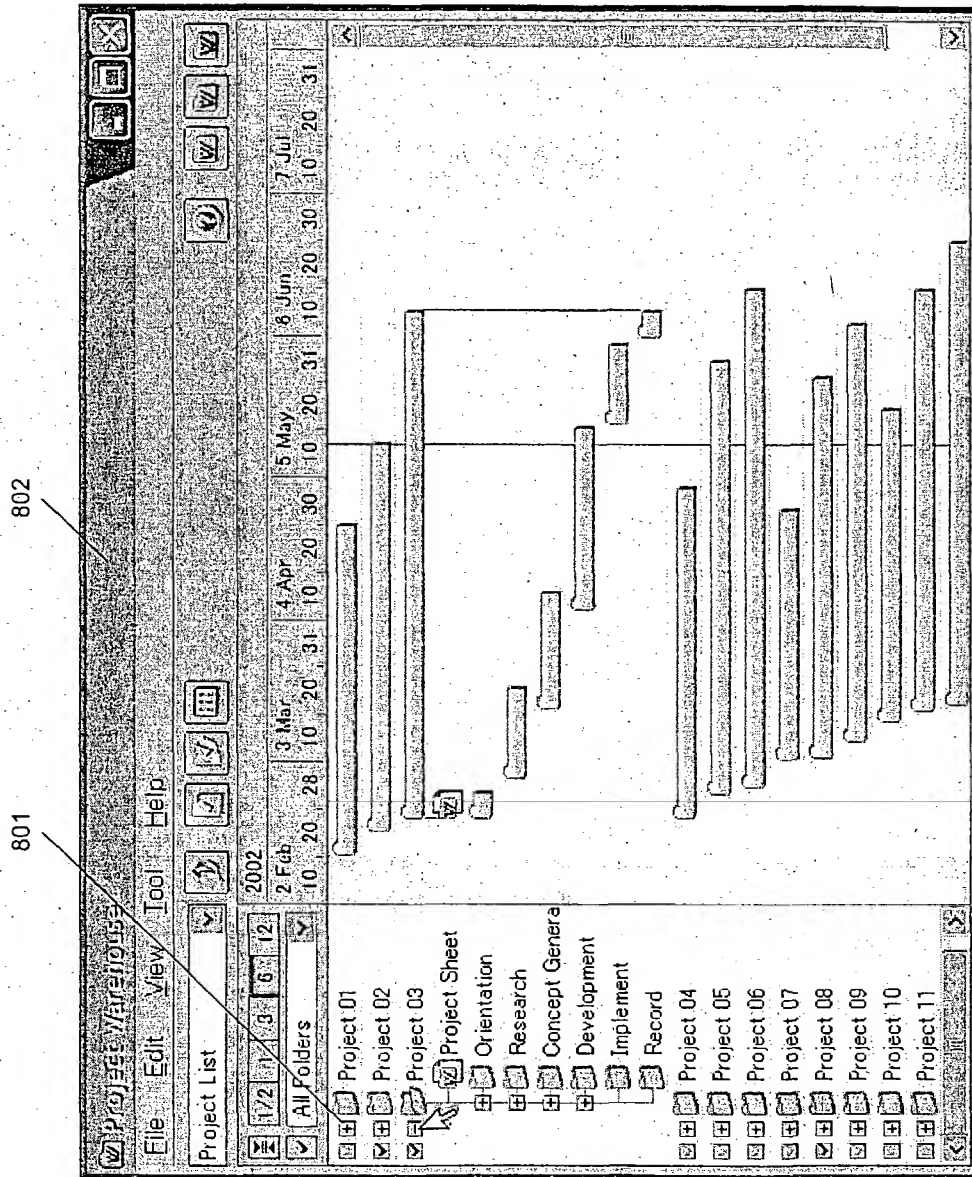


Fig. 8

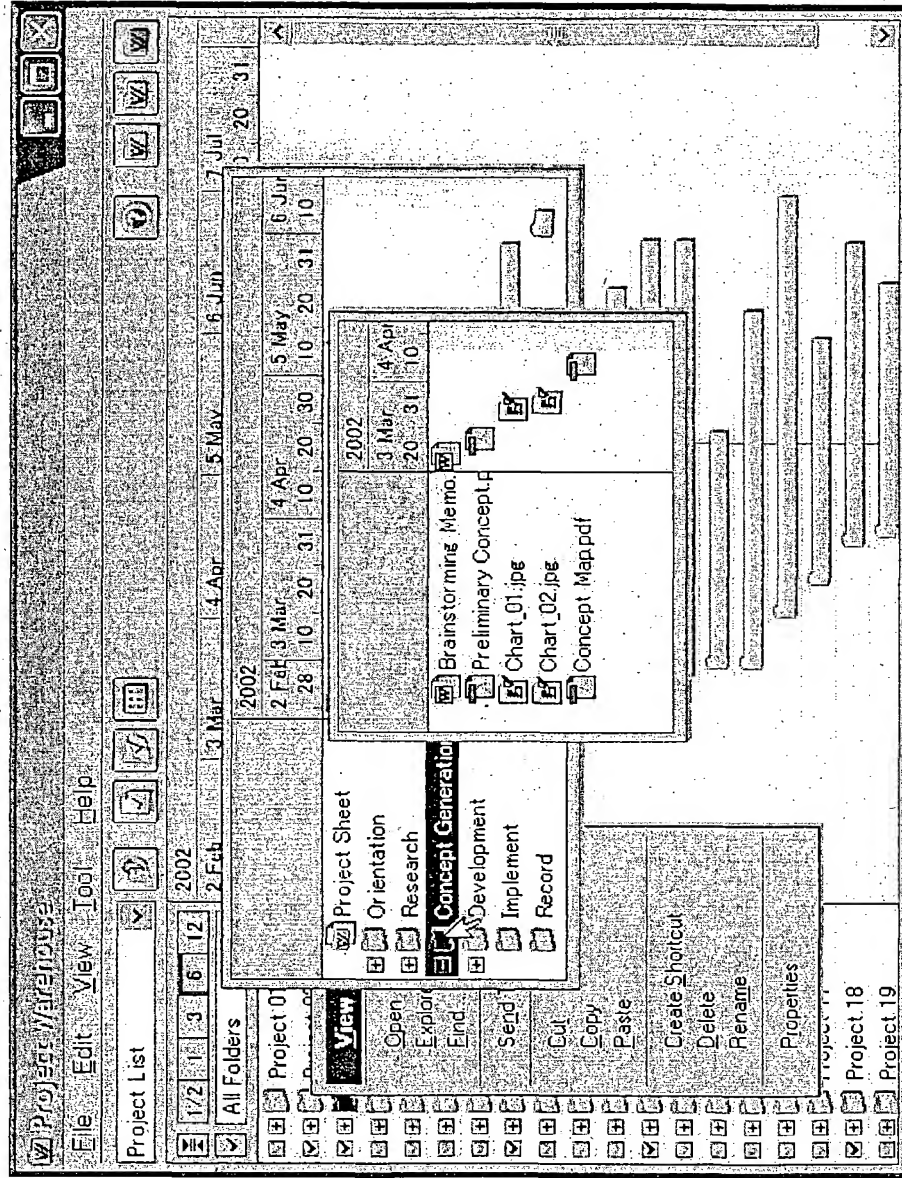


Fig. 9

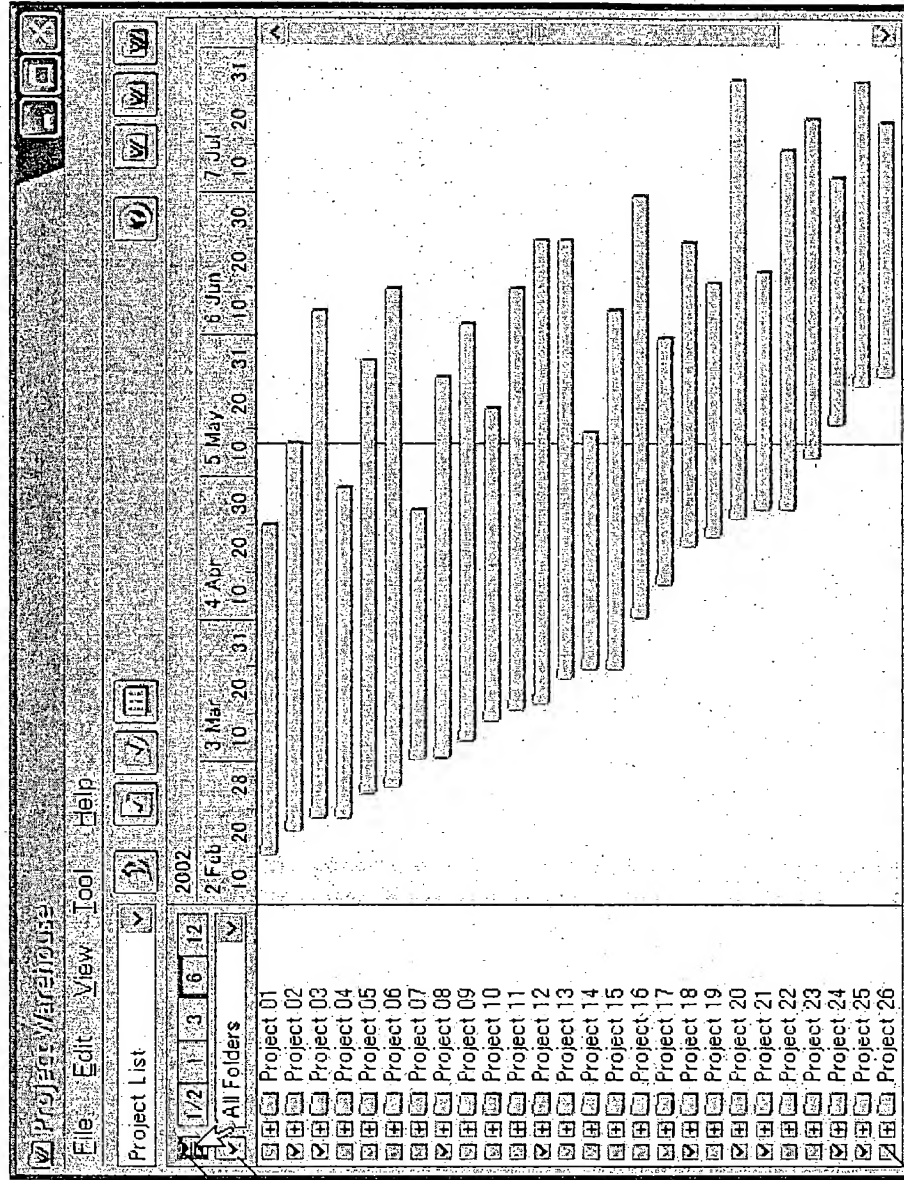


Fig. 10

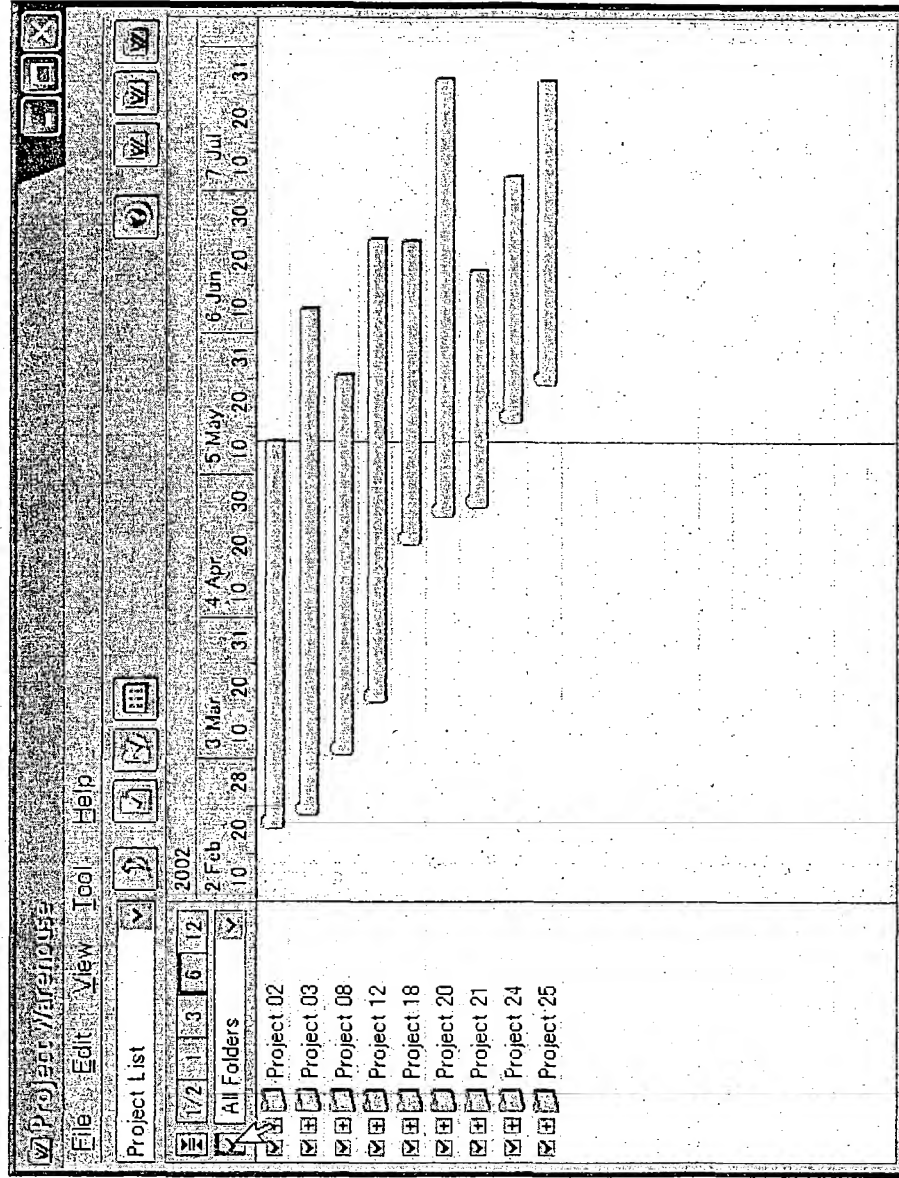


Fig. 11

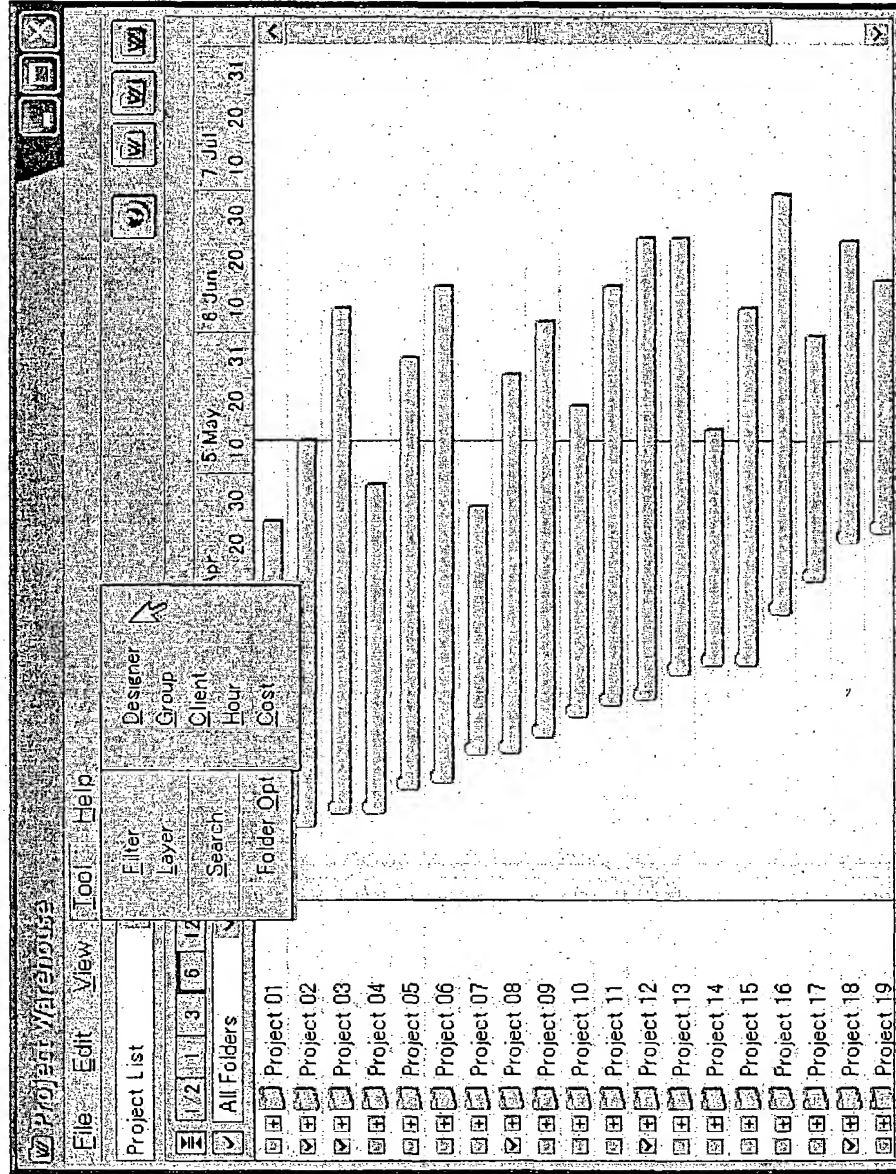
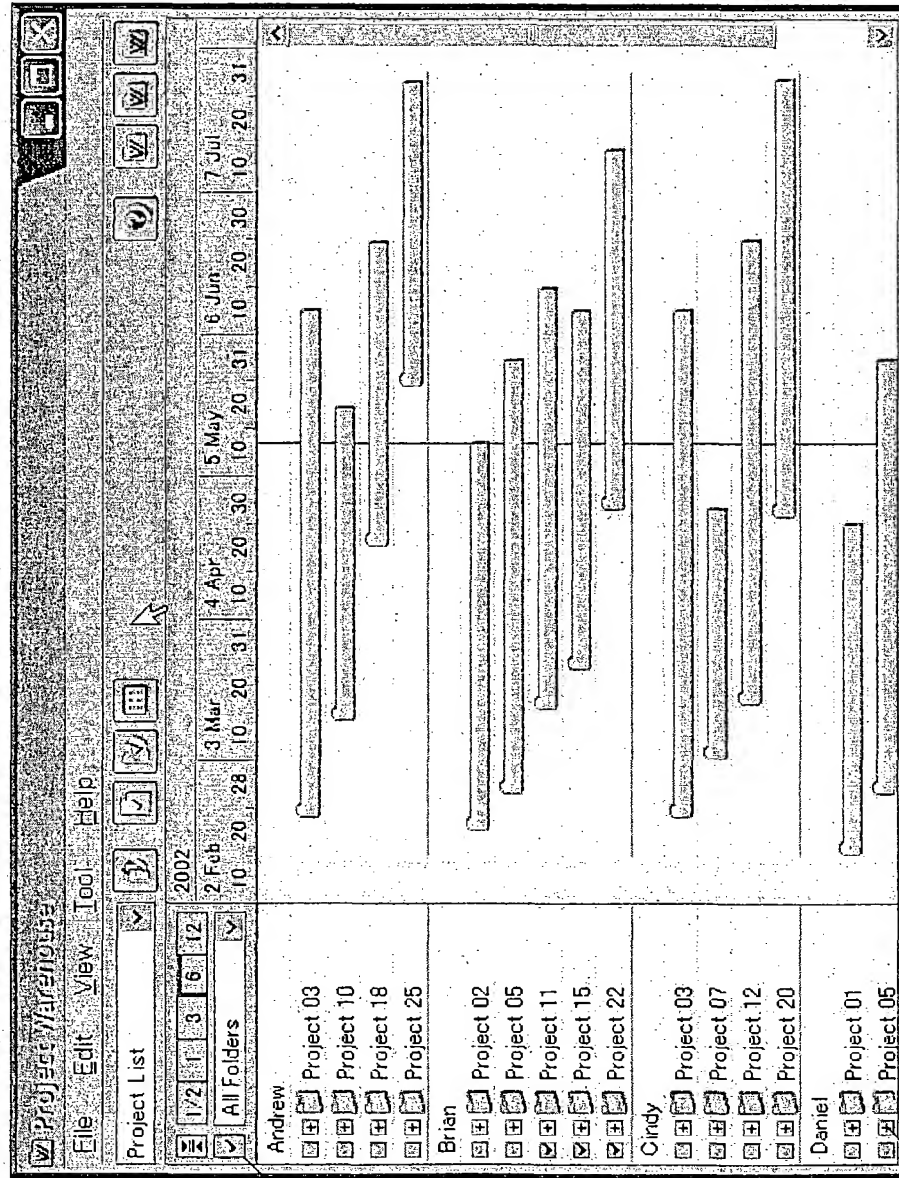


Fig. 12



1302

1301

Fig. 13

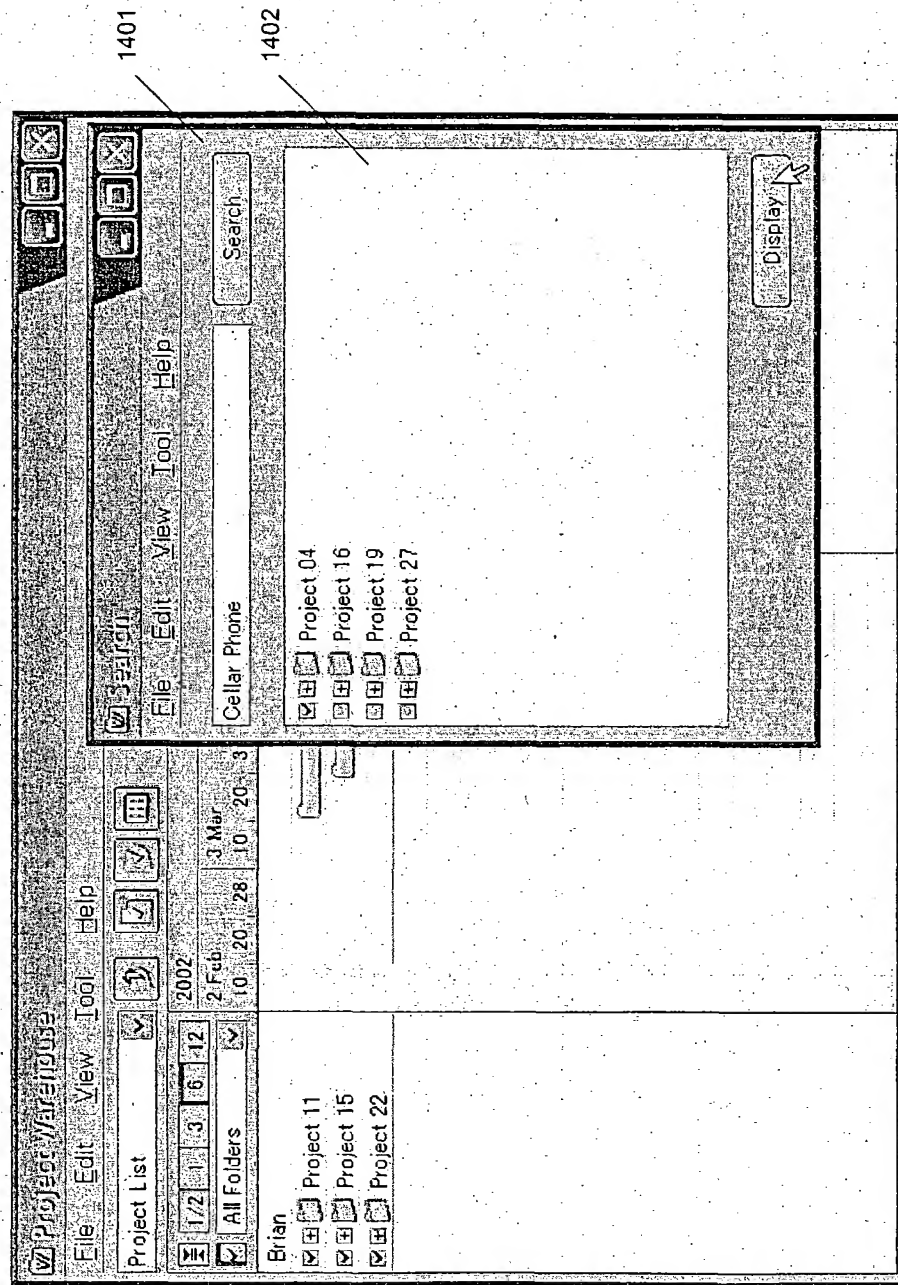
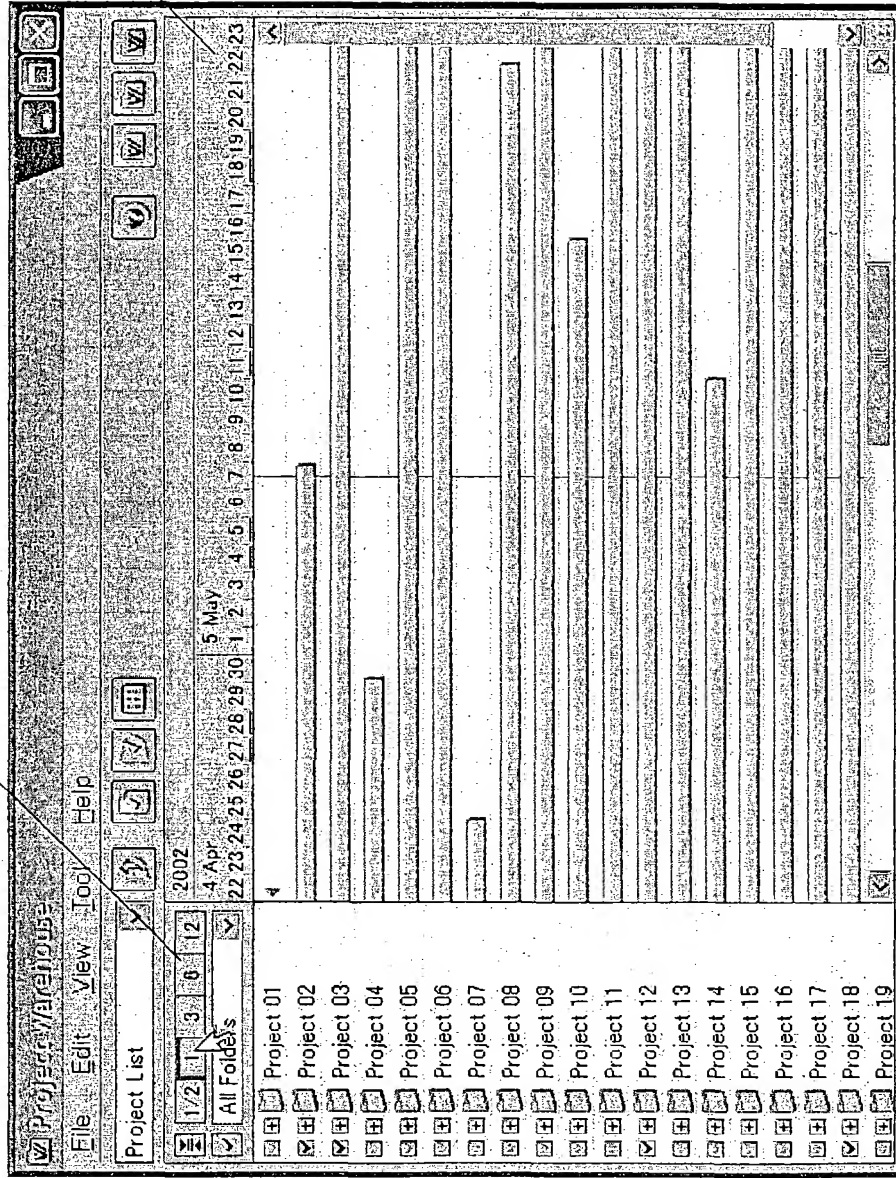


Fig. 14

1501



1502

Fig. 15

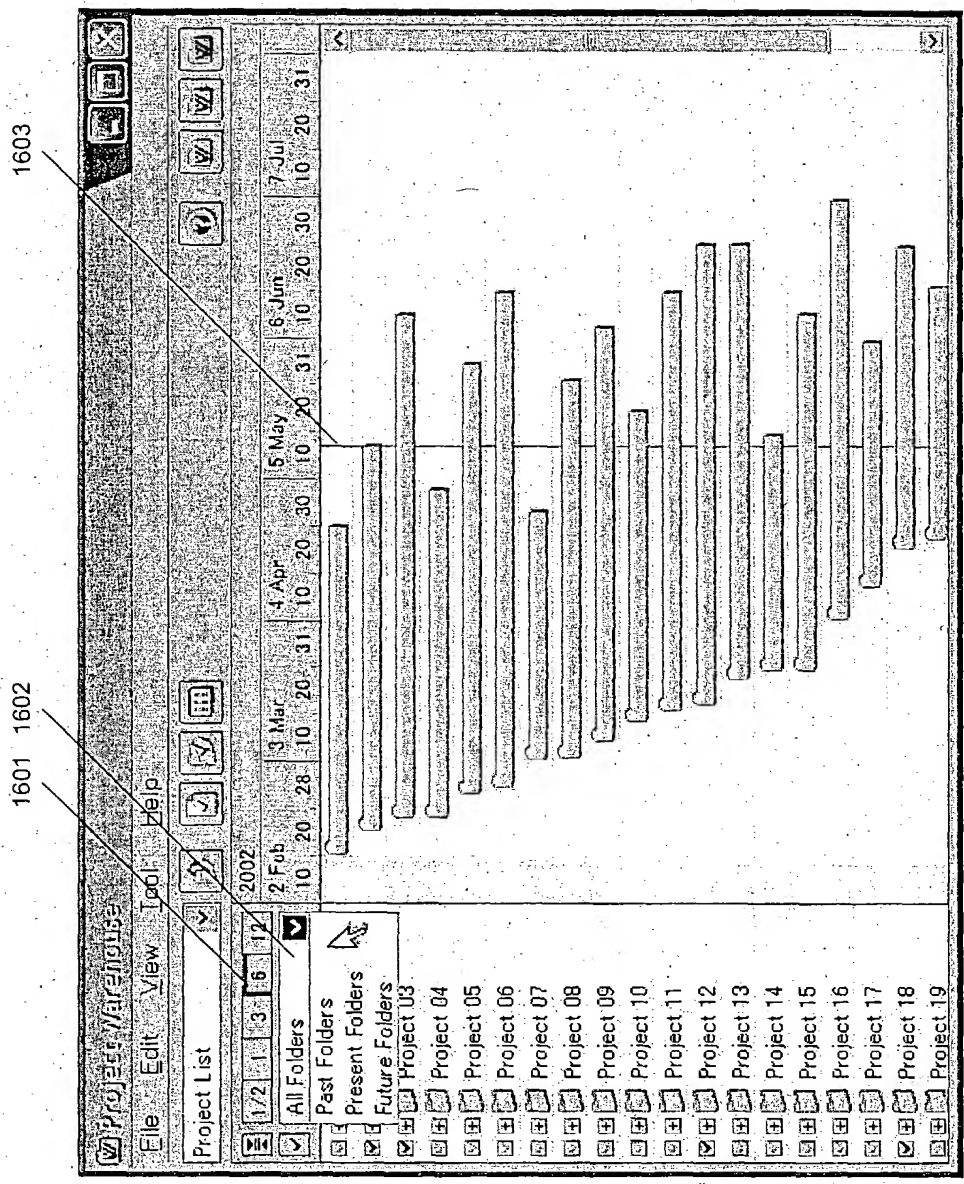


Fig. 16

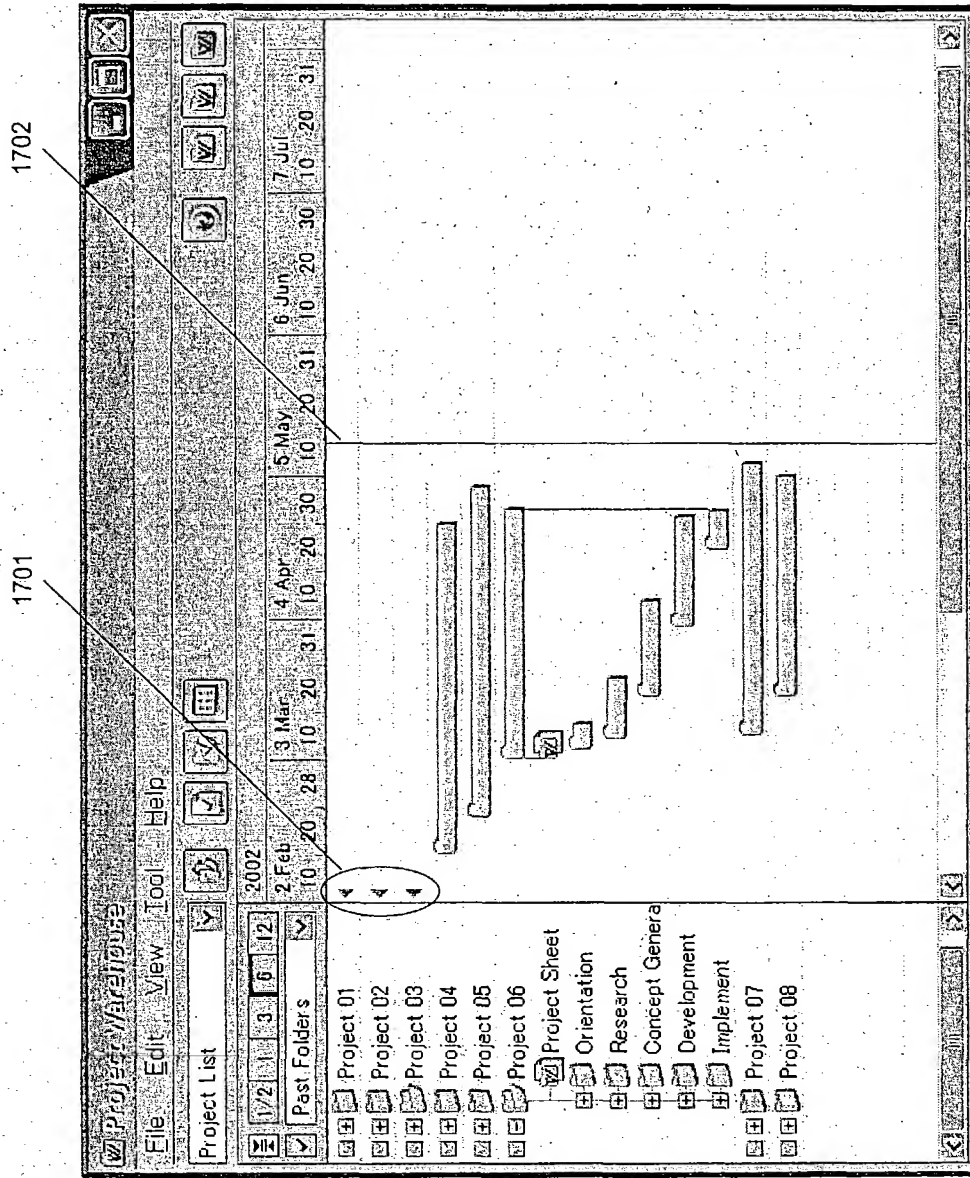


Fig. 17

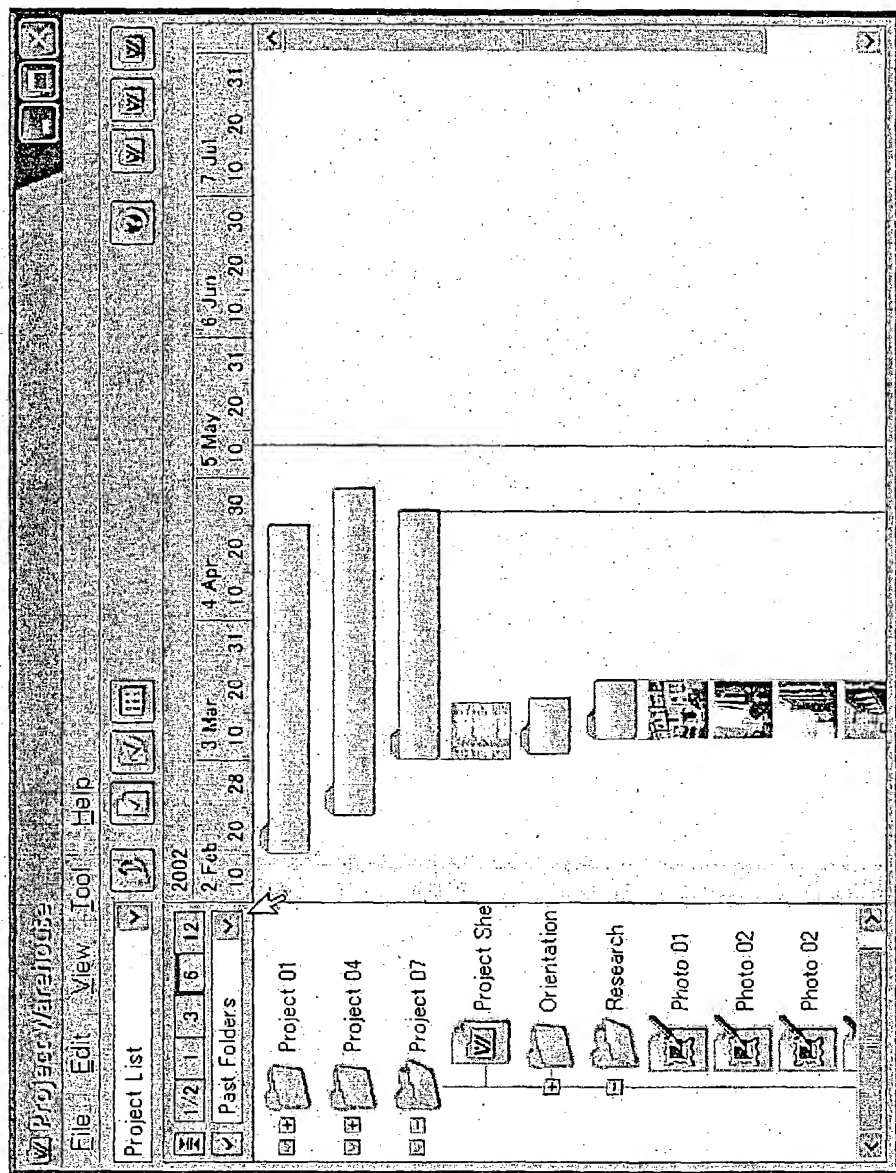


Fig. 18

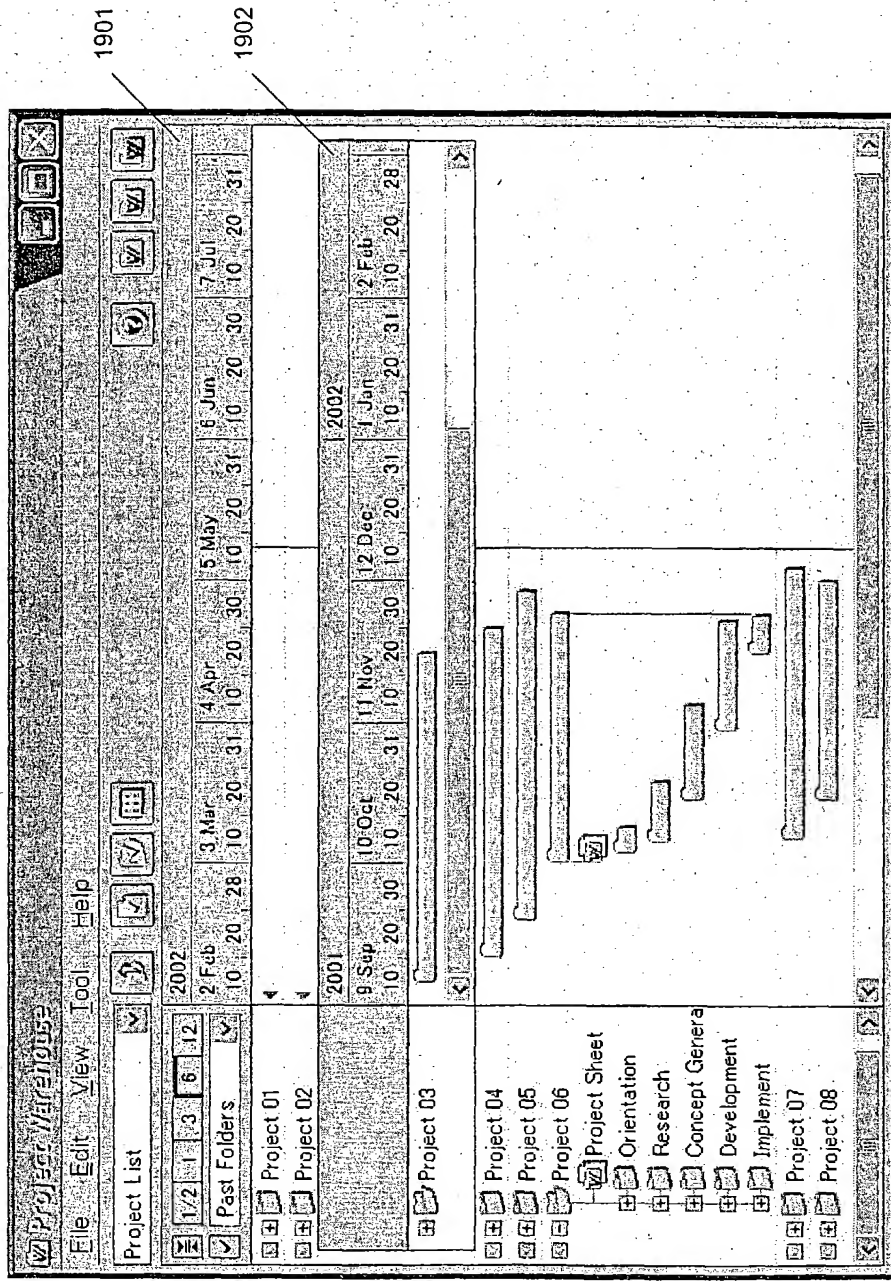


Fig. 19

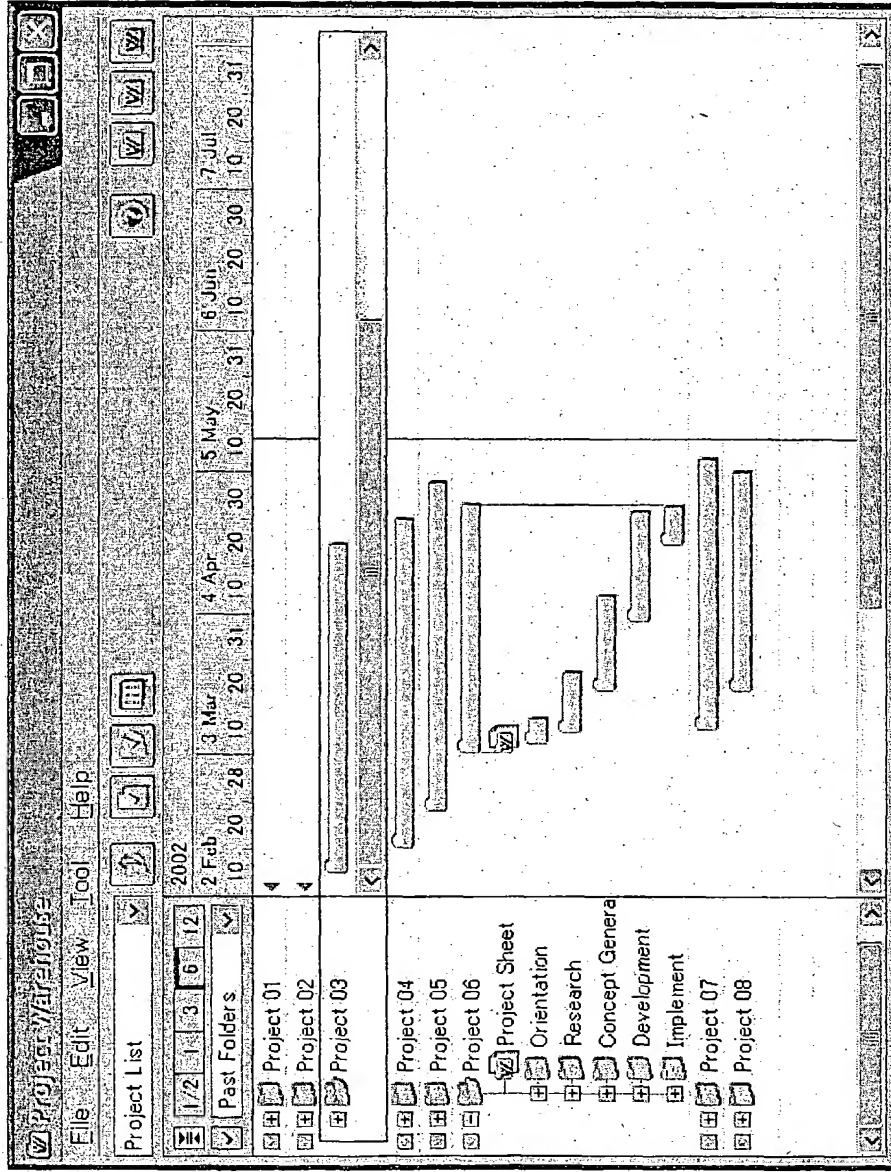


Fig. 20

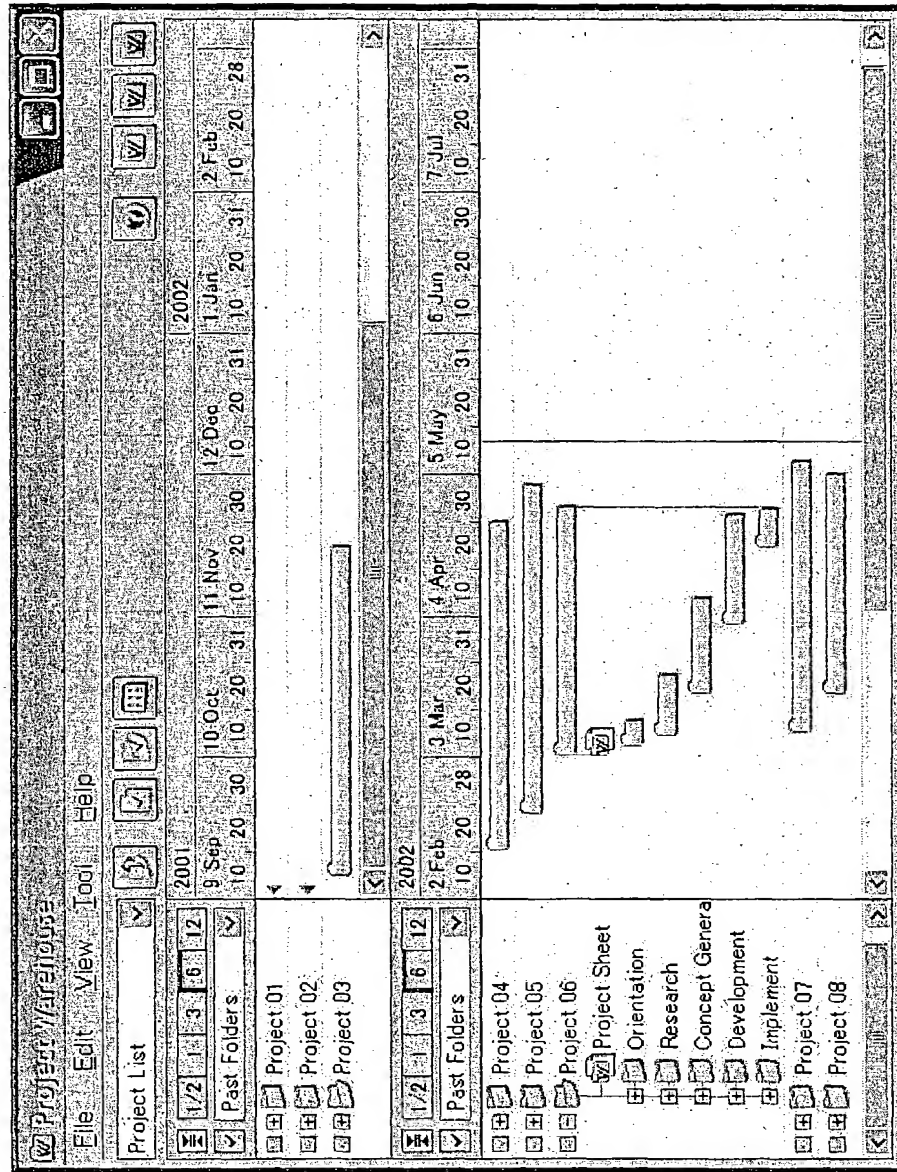


Fig. 21

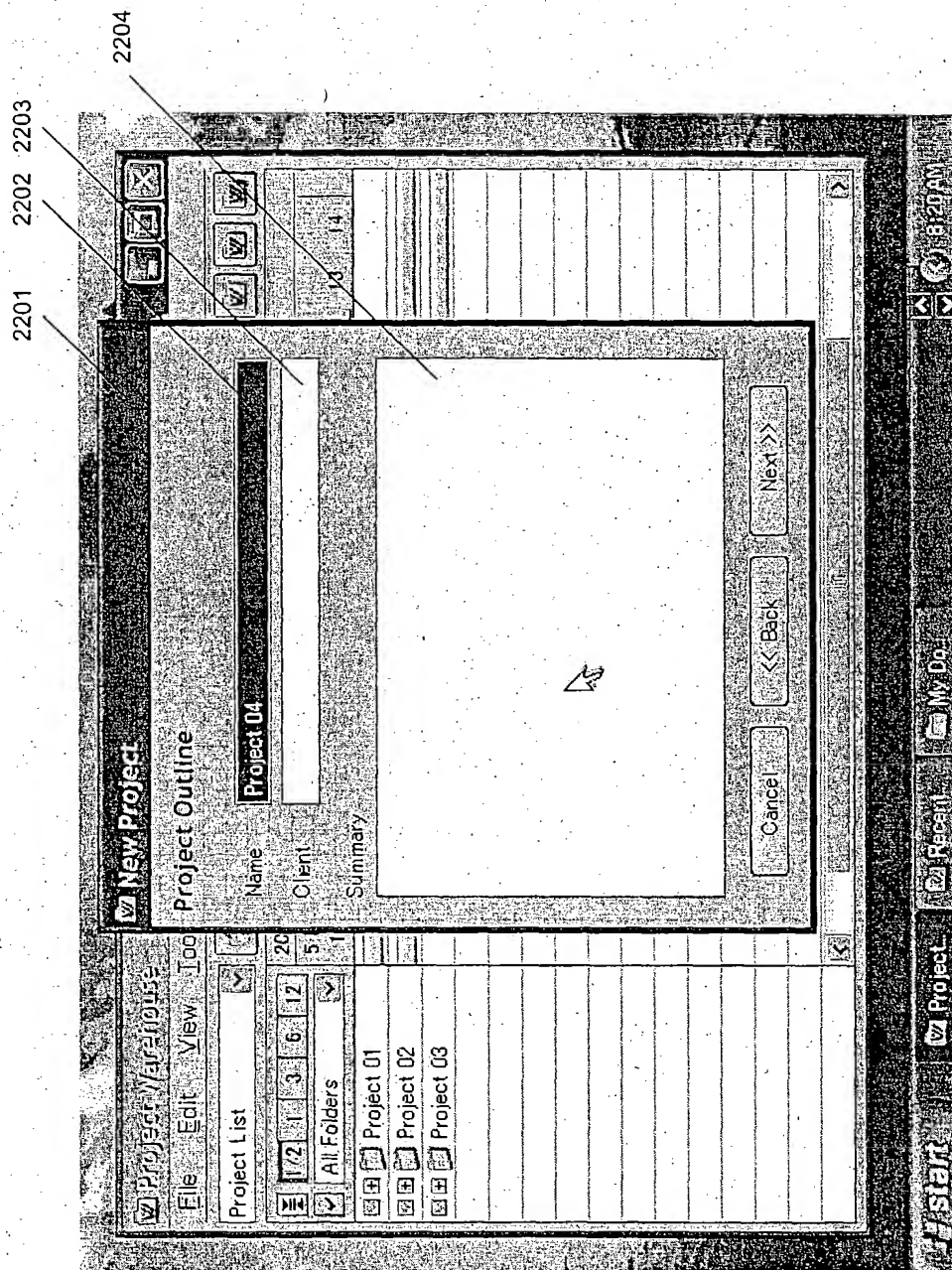


Fig. 22

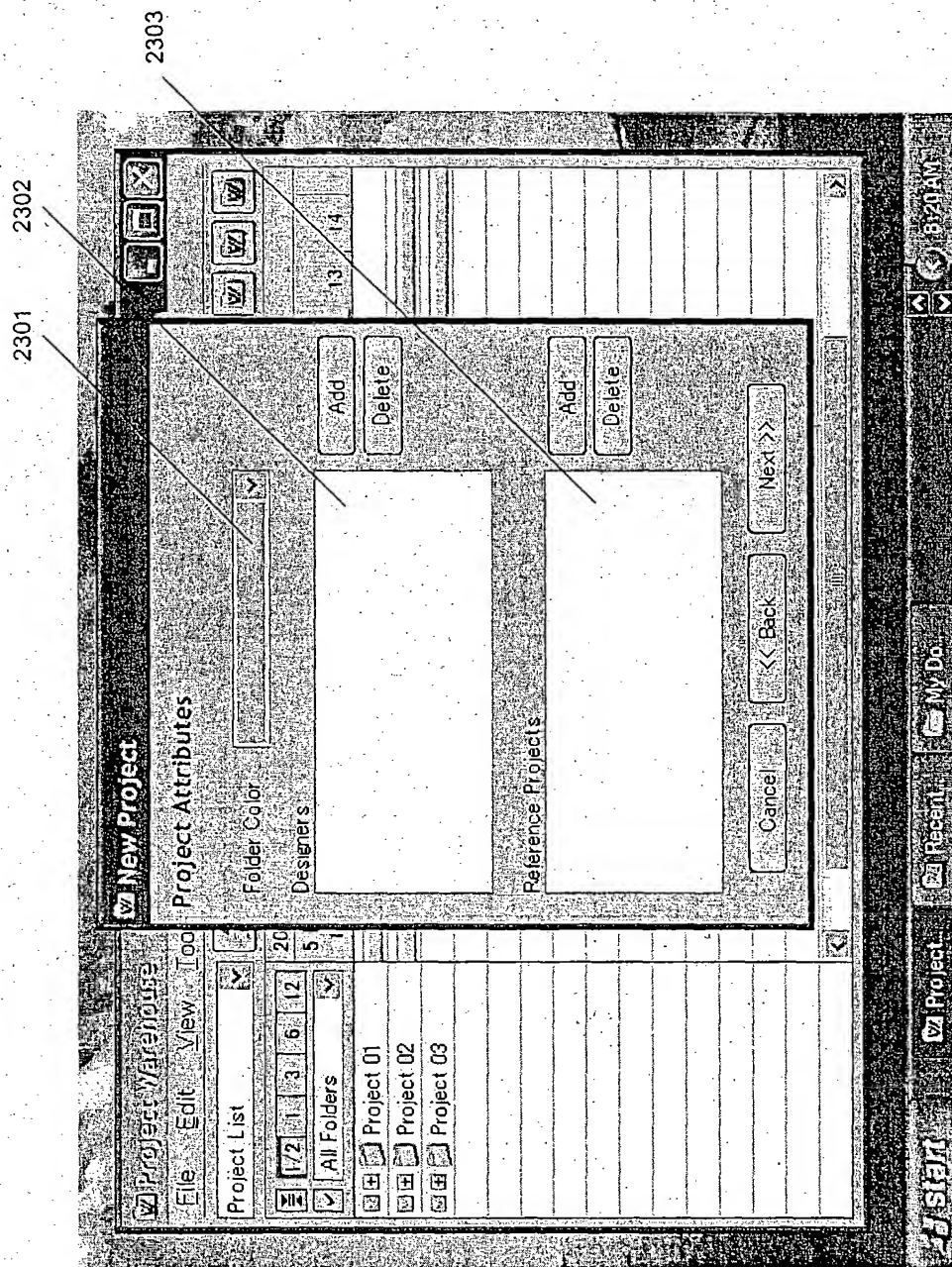


Fig. 23

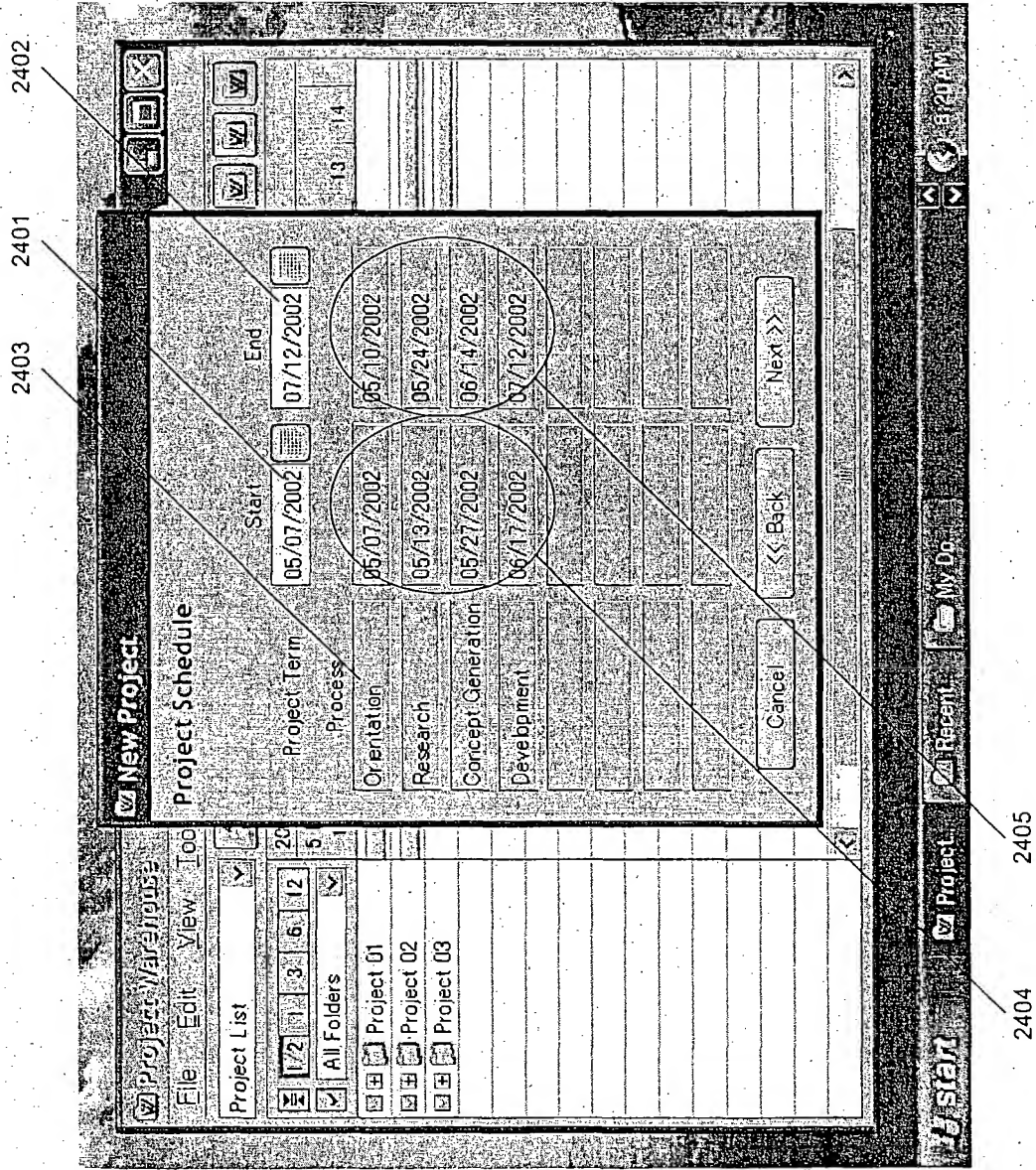
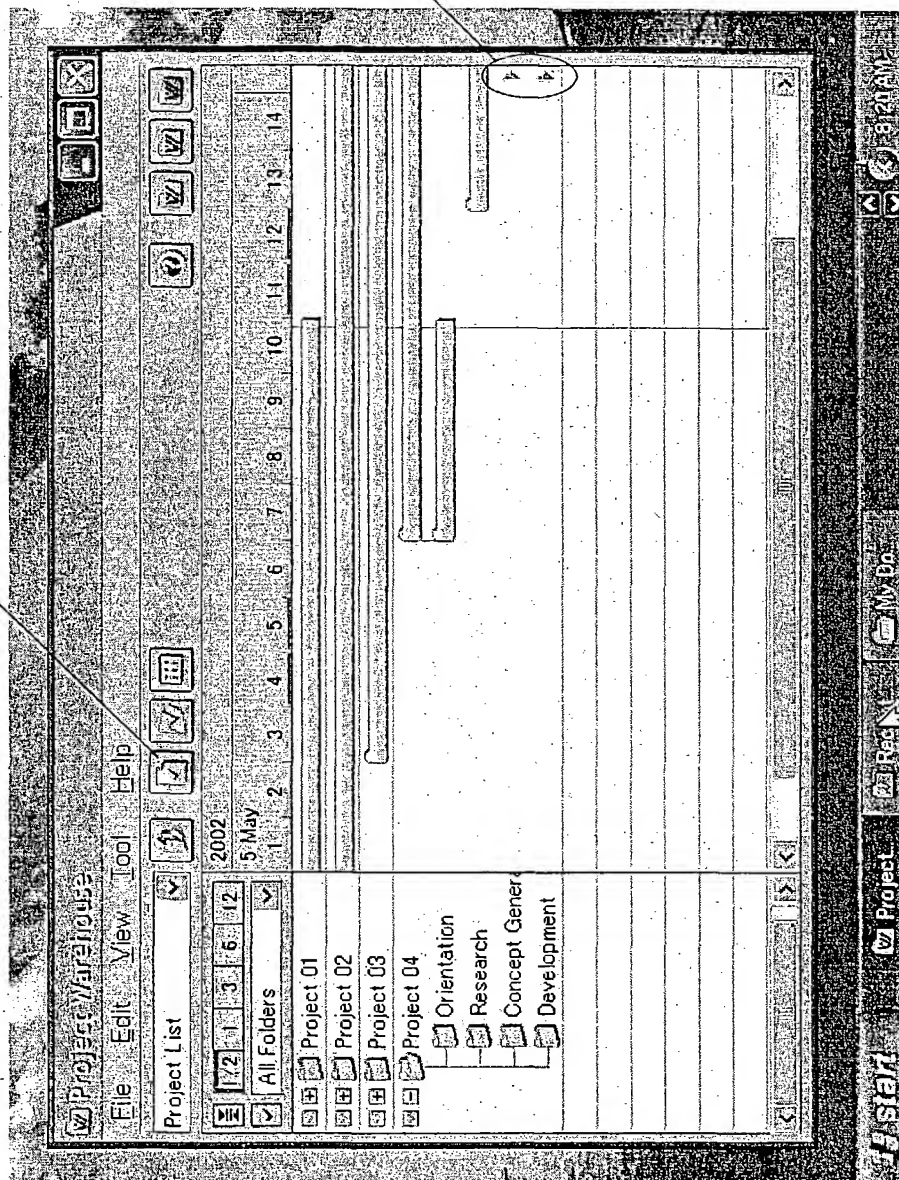


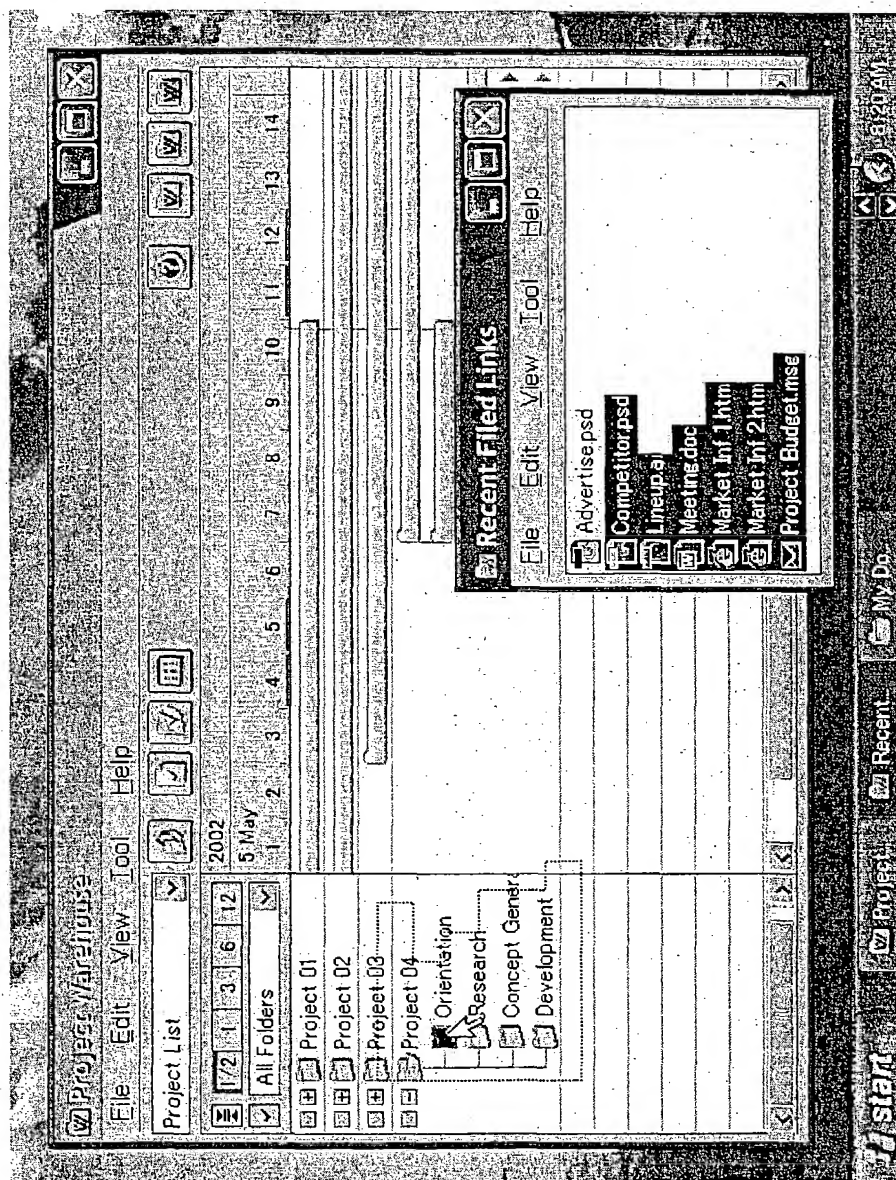
Fig. 24

2502



2501

Fig. 25



2601

Fig. 26

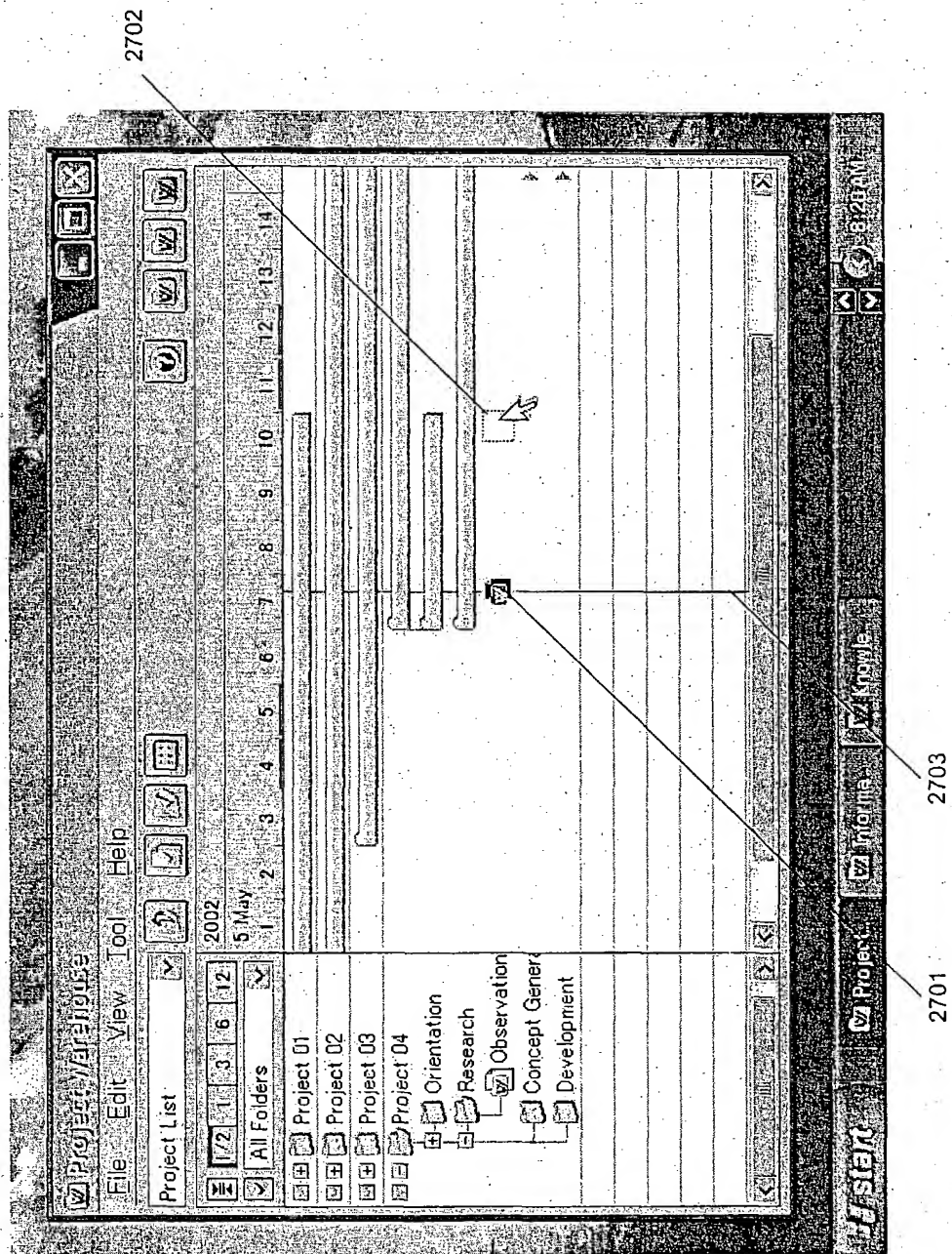


Fig. 27

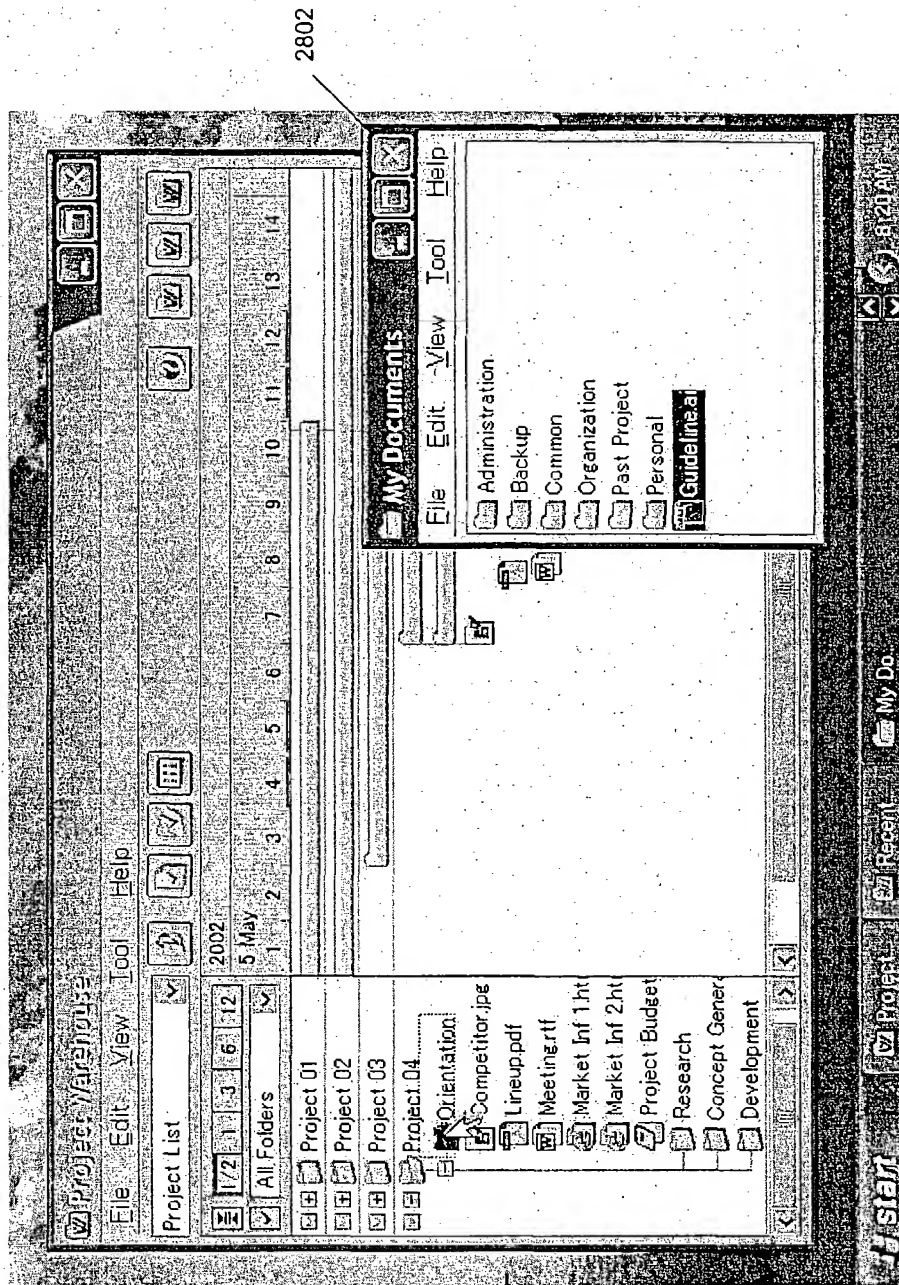


Fig. 28

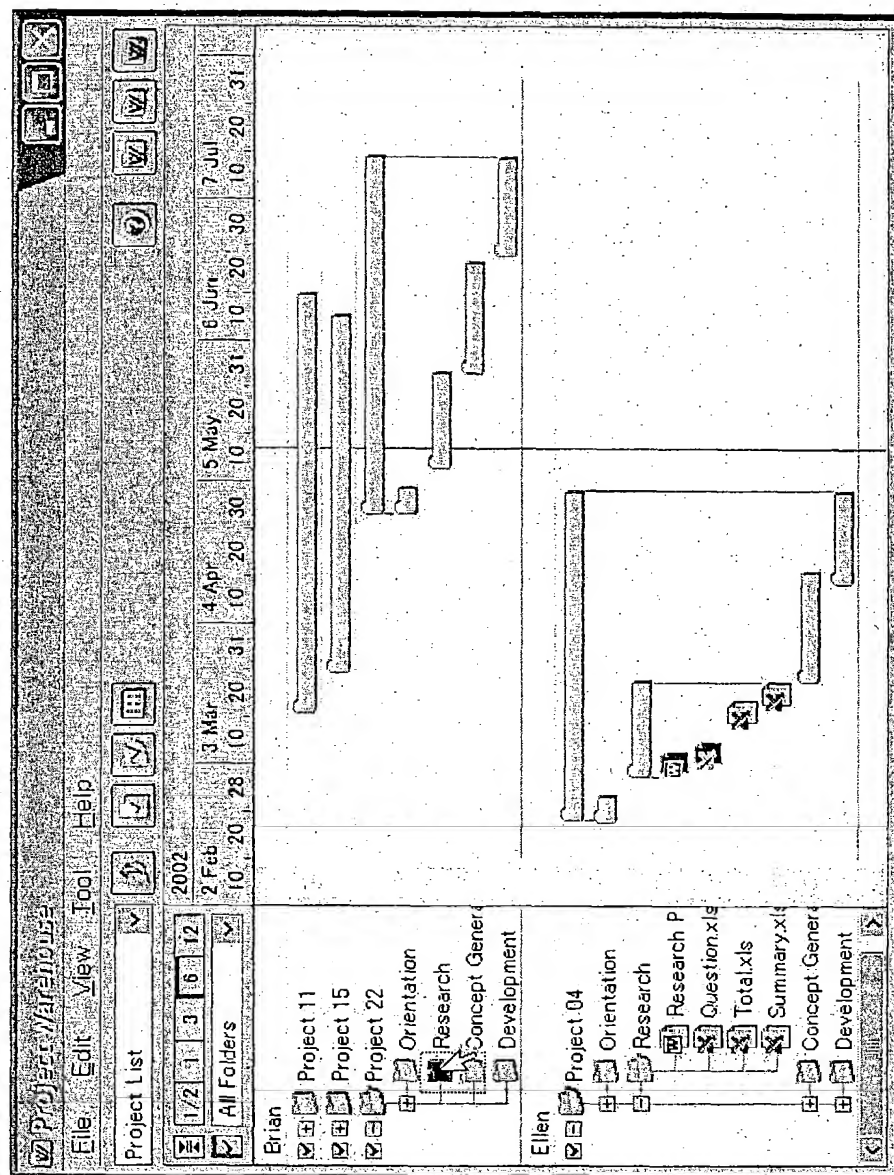


Fig. 29

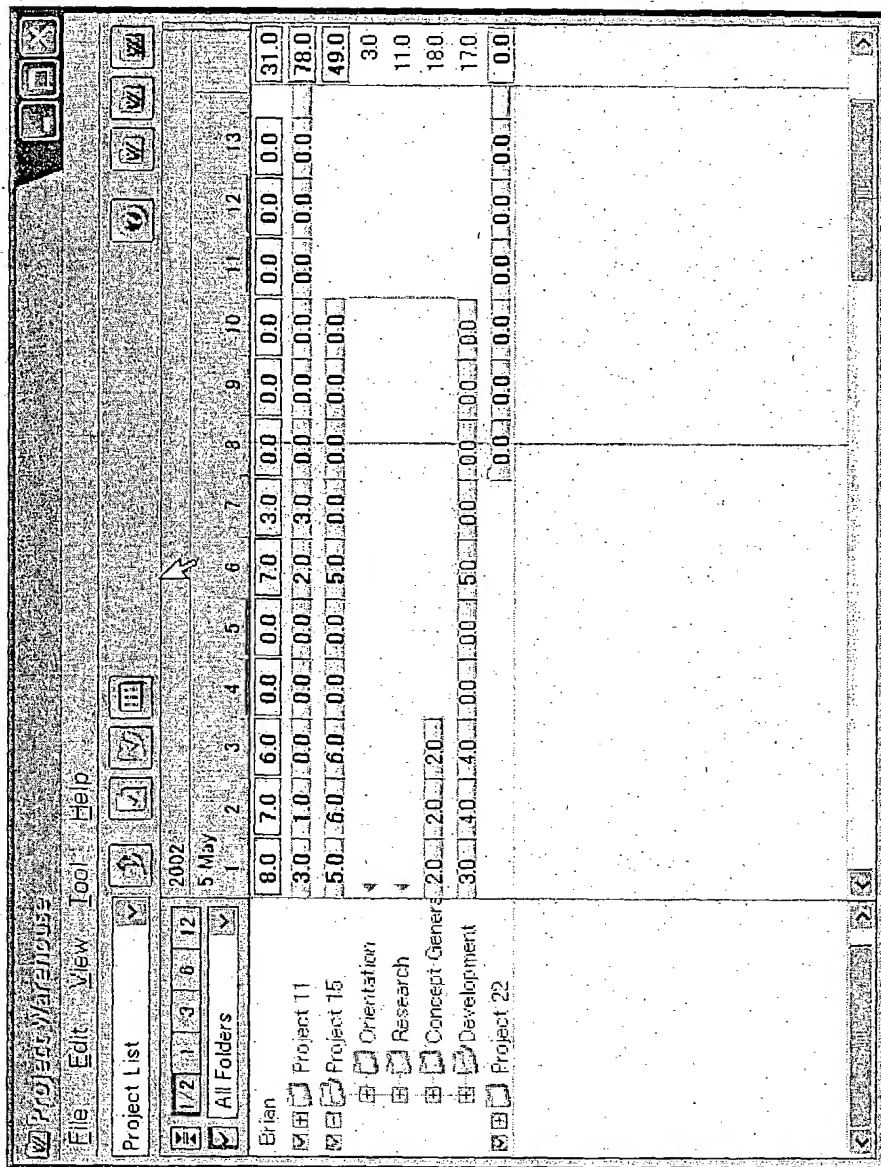


Fig. 30

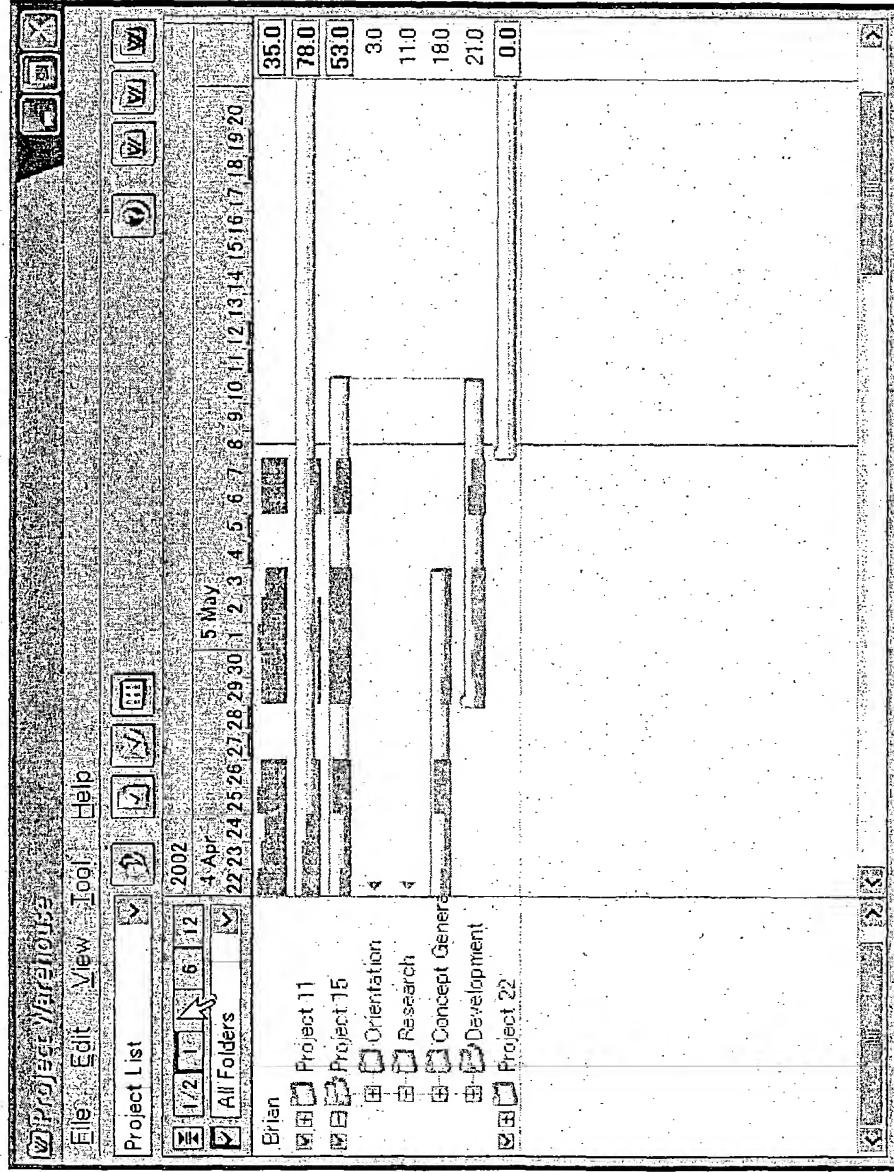


Fig. 31

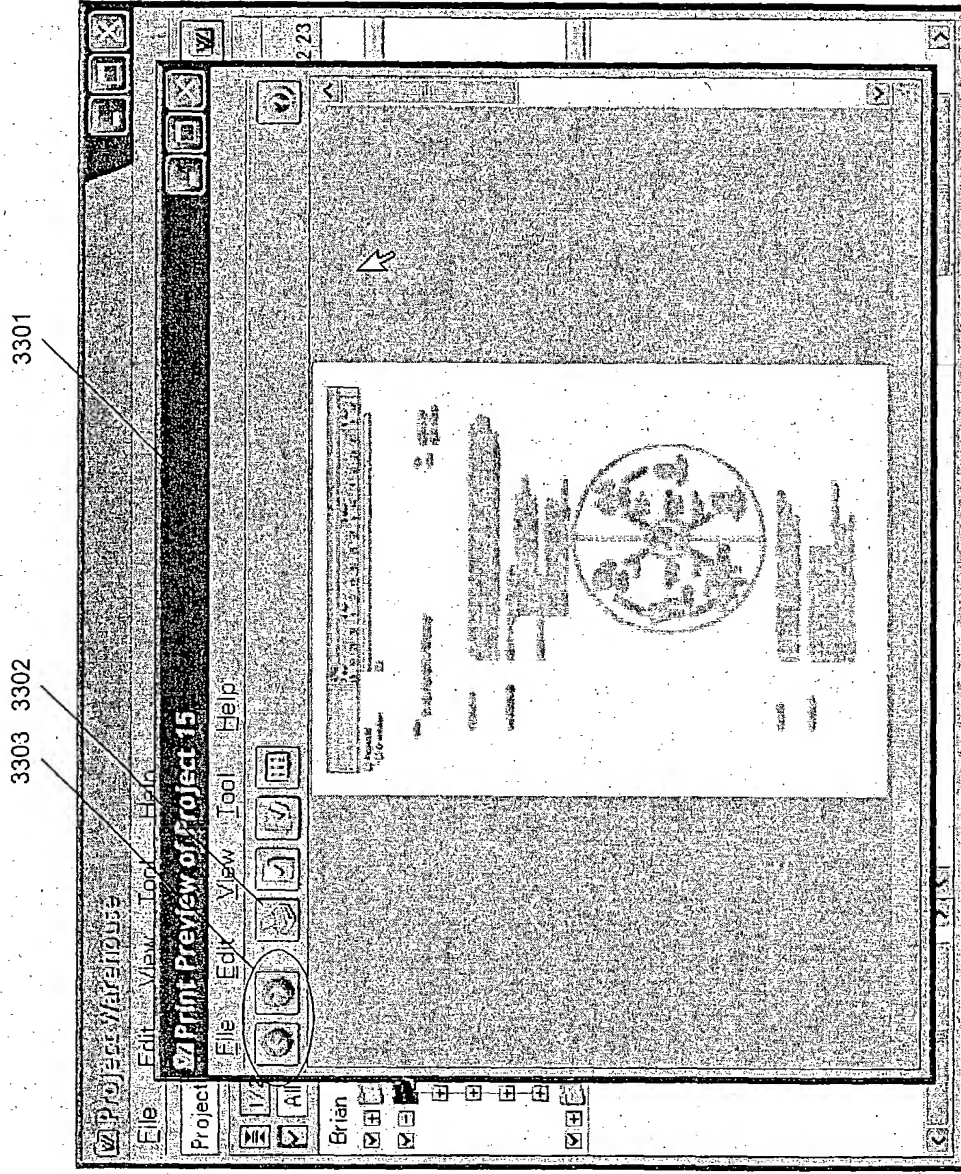


Fig. 33

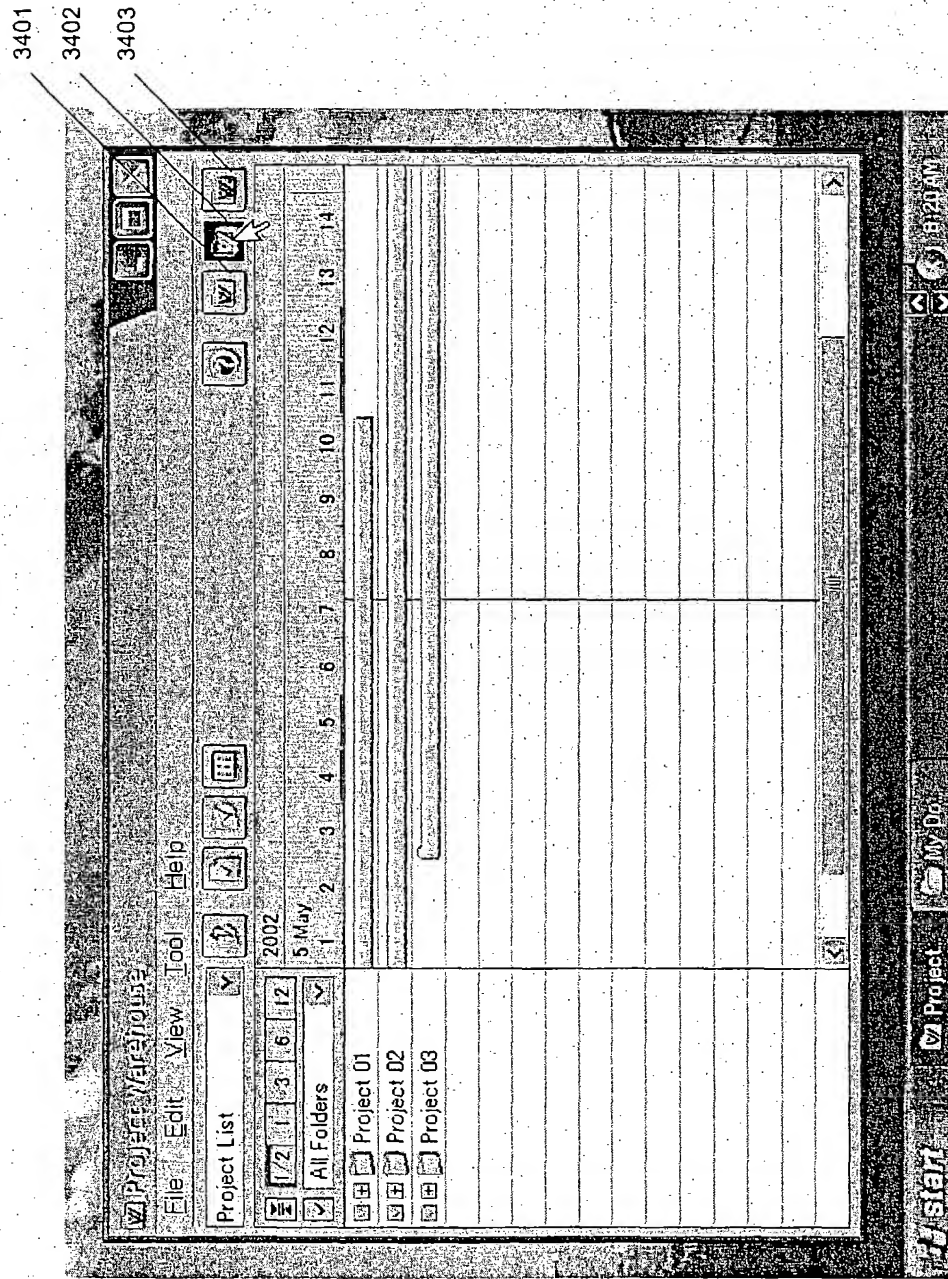


Fig. 34

3502 3501

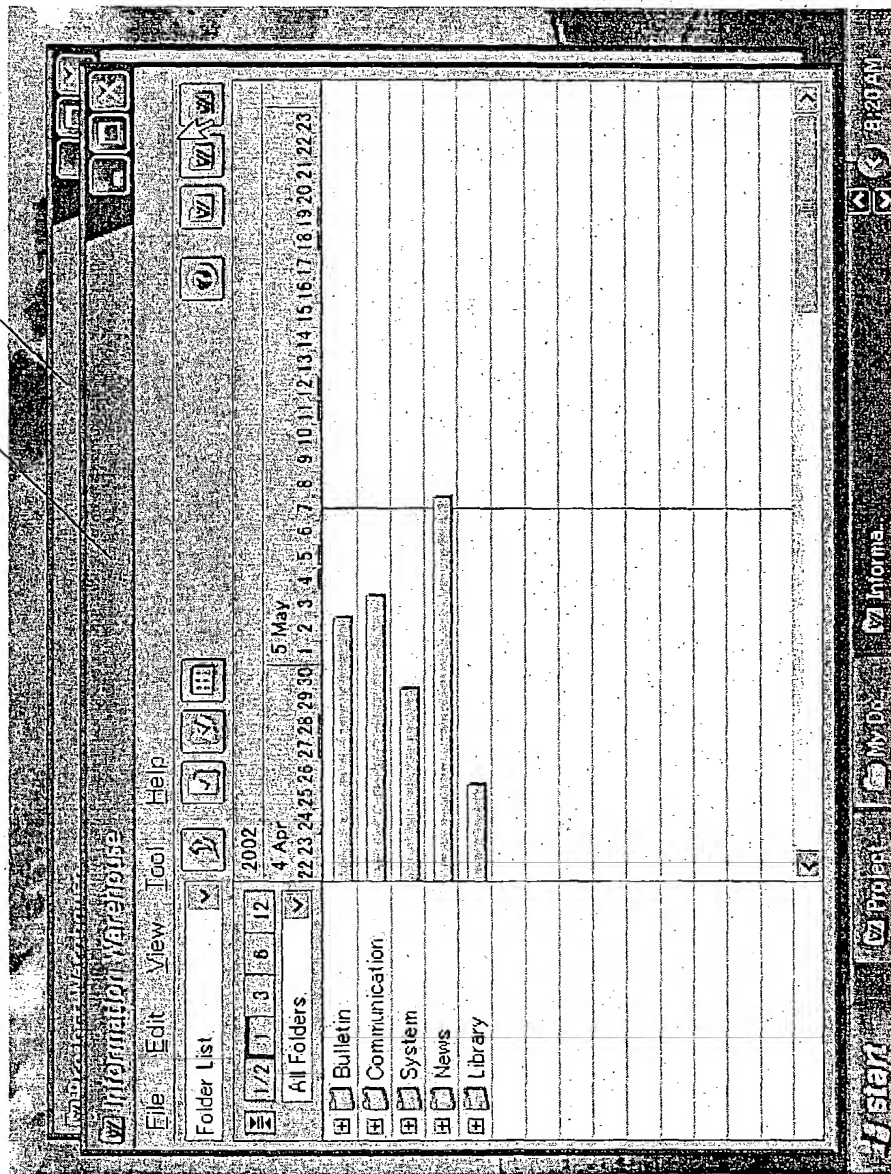


Fig. 35

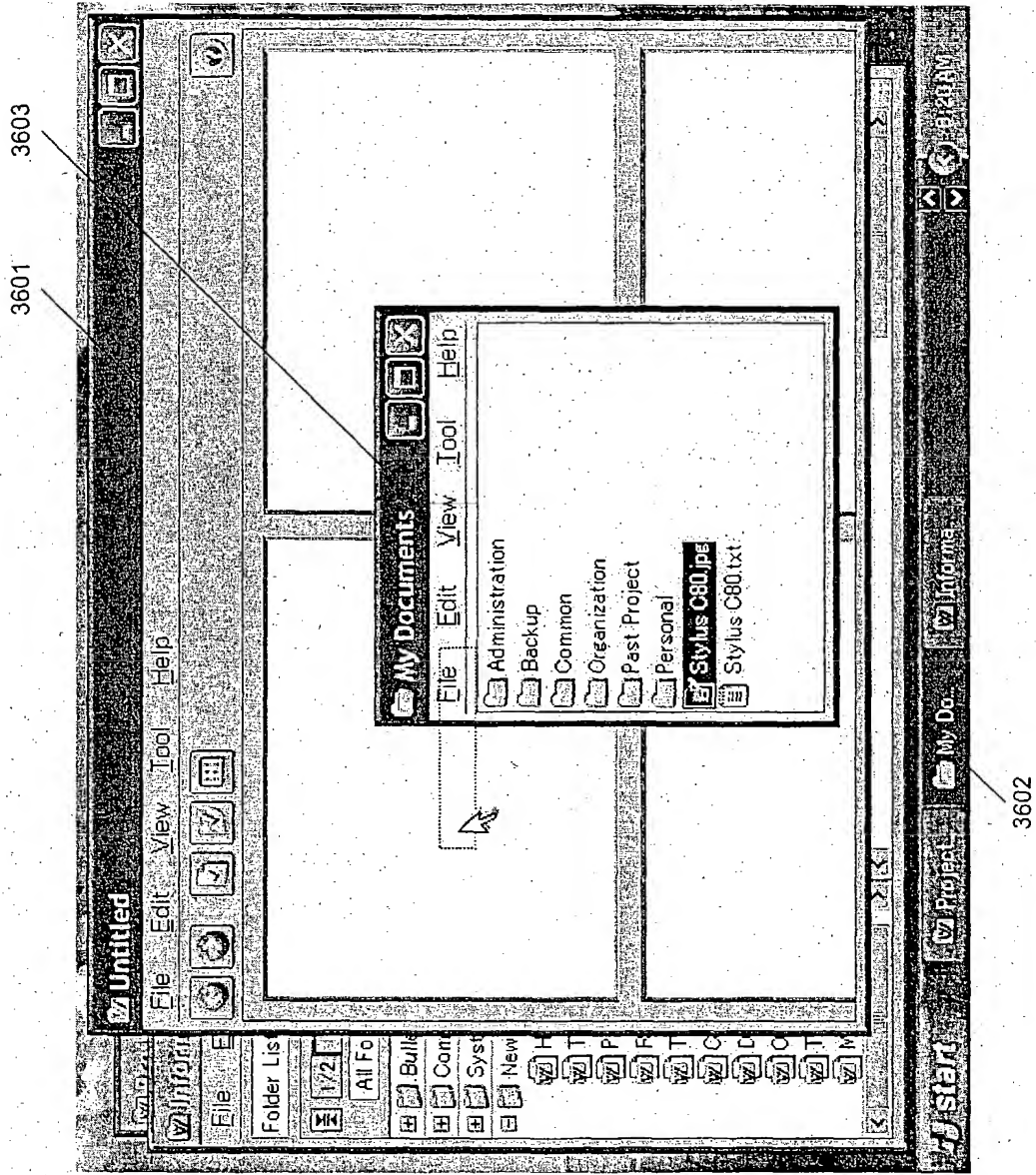


Fig. 36

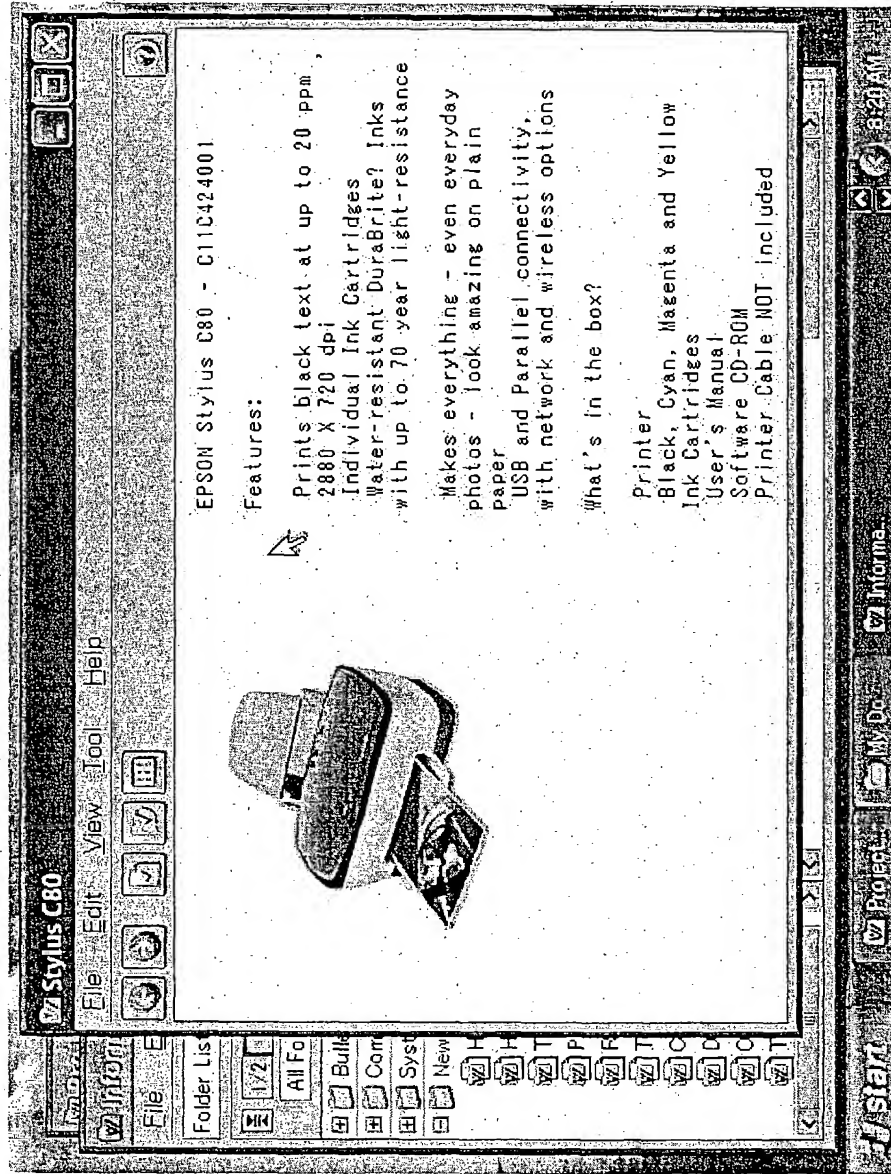


Fig. 37

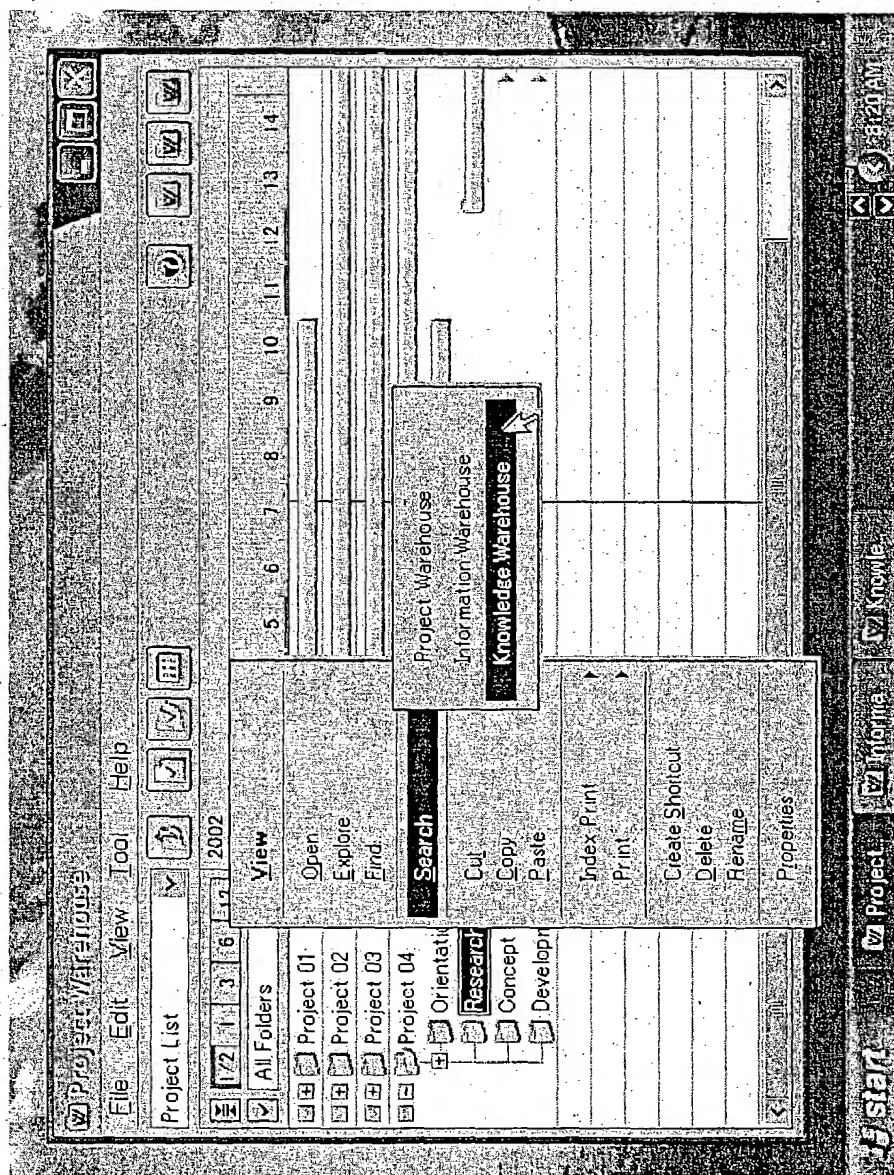


Fig. 38

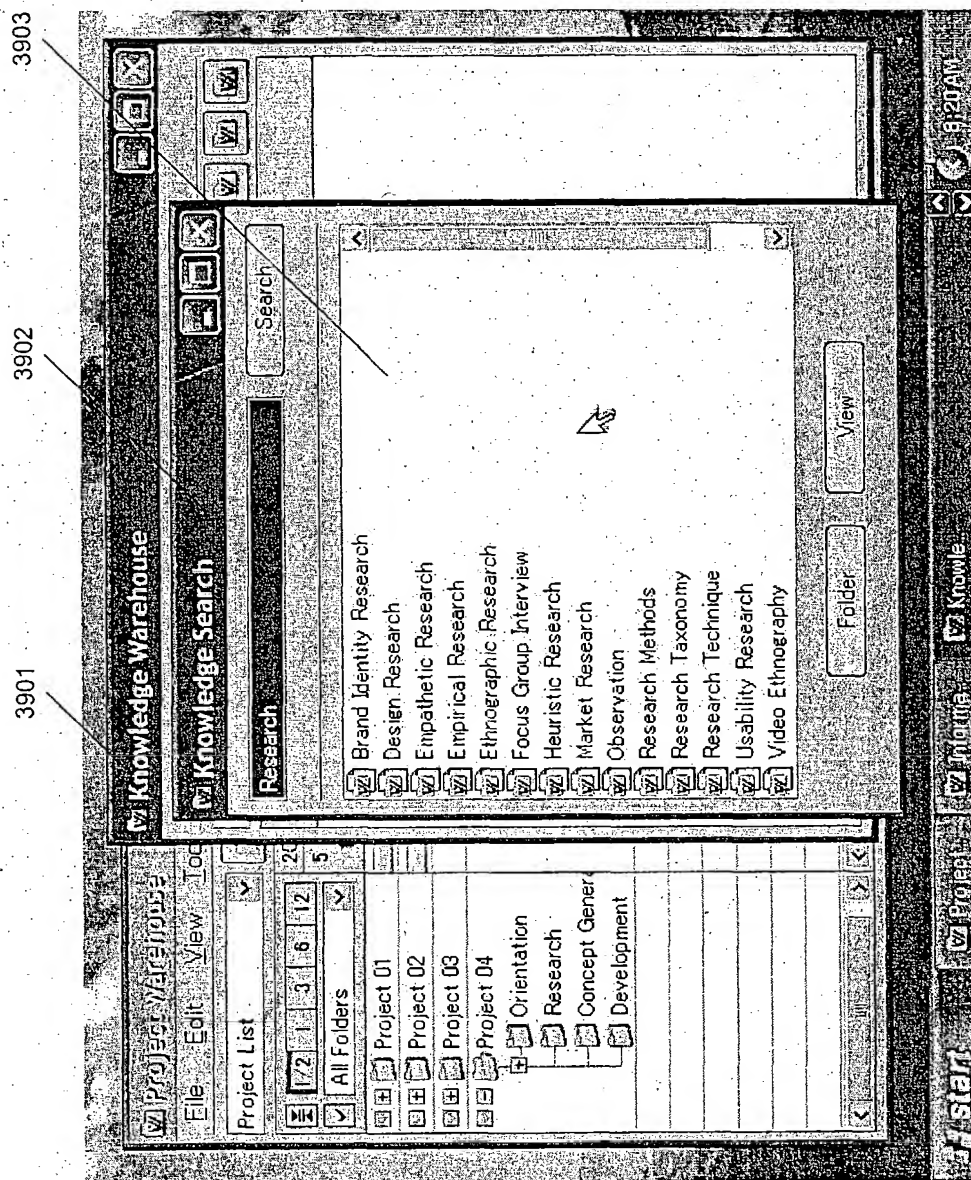


Fig. 39

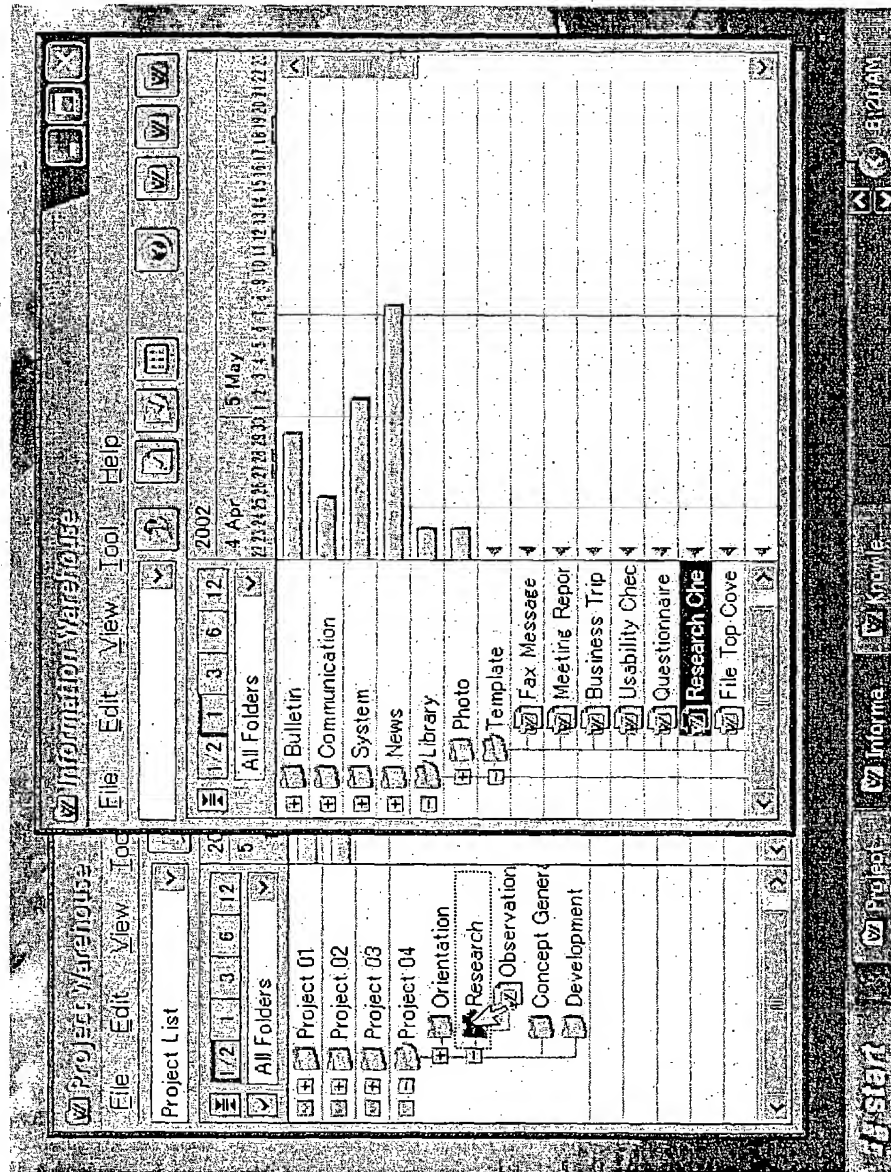


Fig. 40

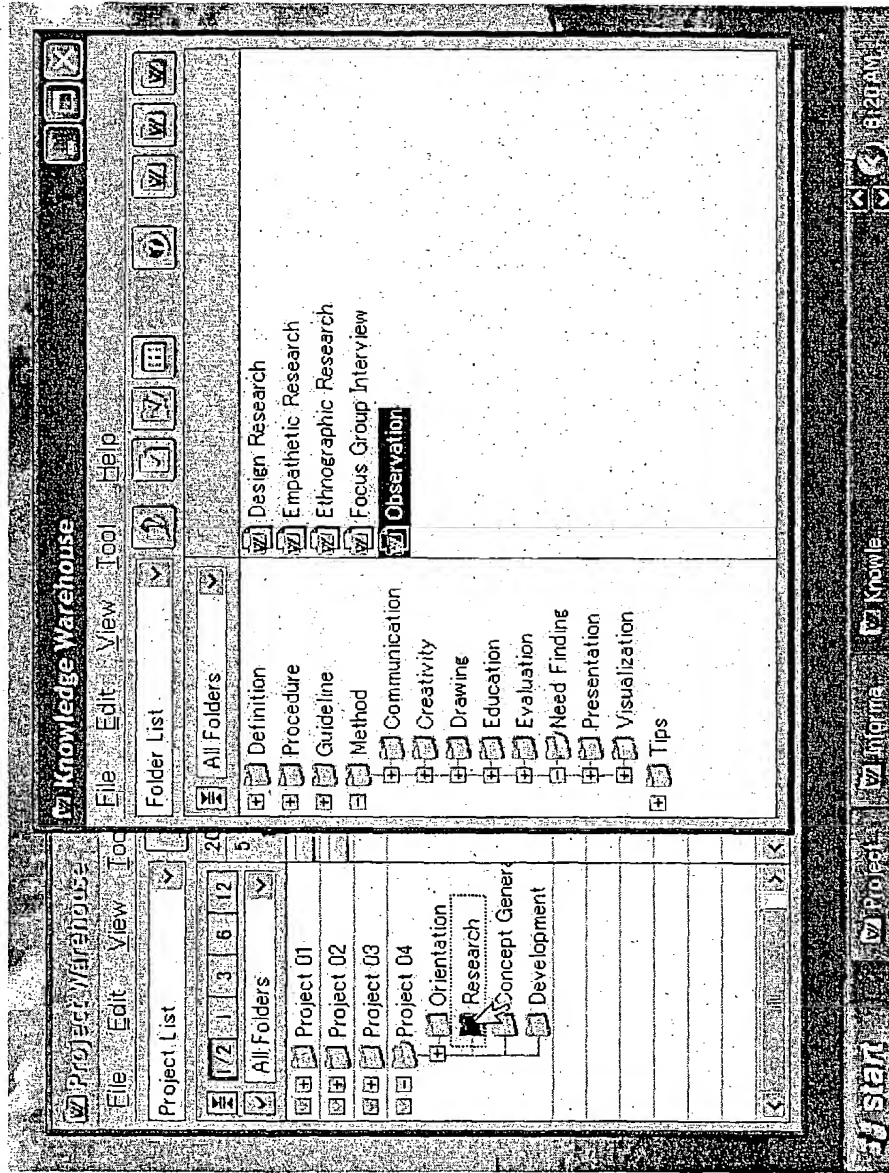


Fig. 41

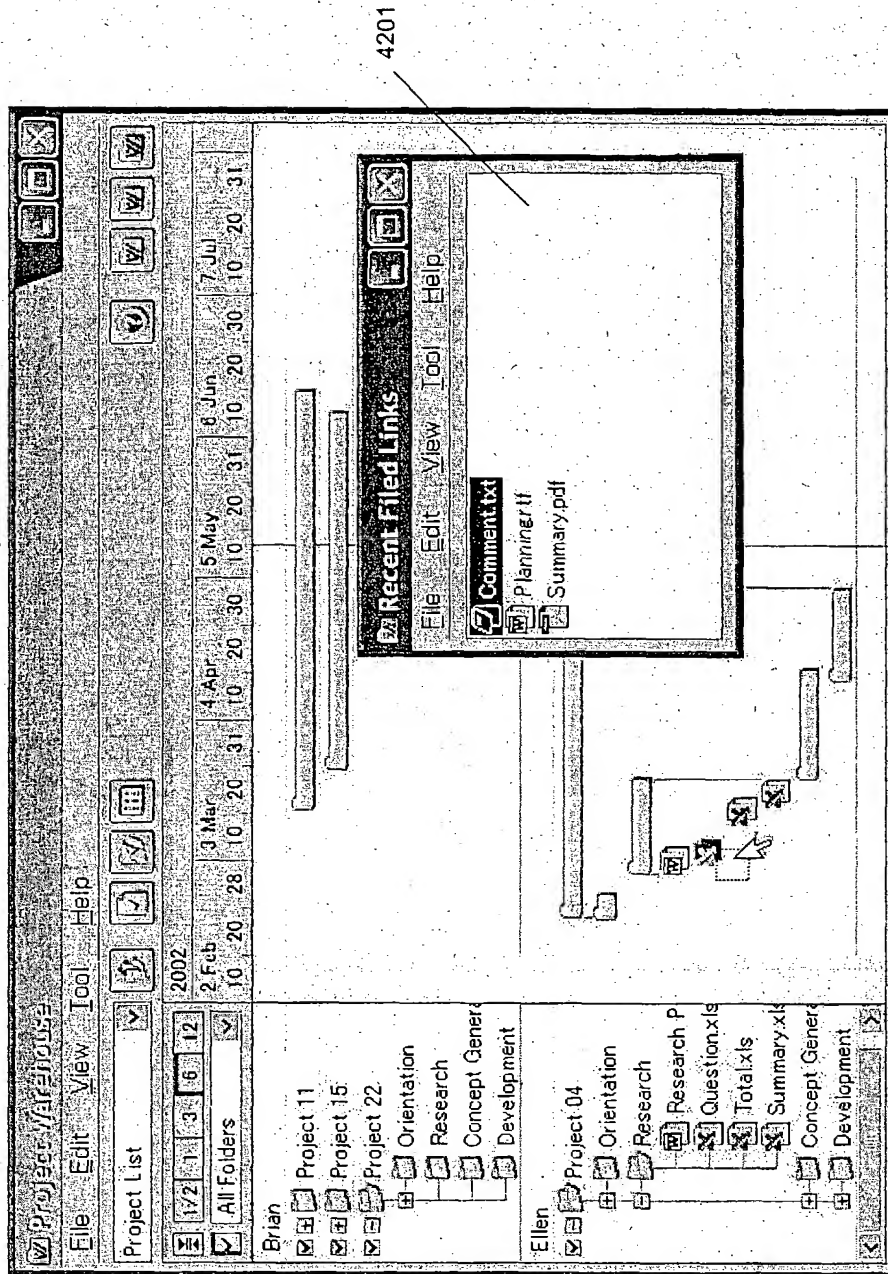


Fig. 42

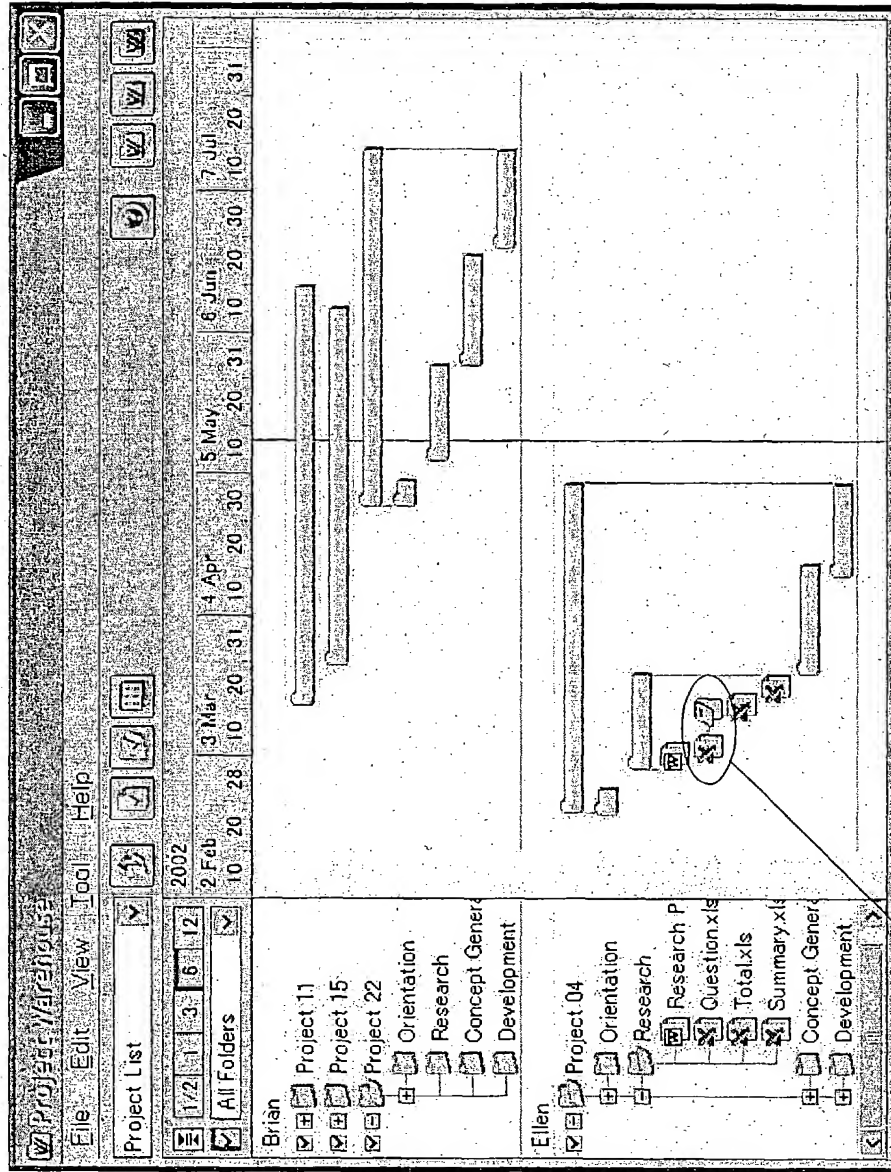


Fig. 43

